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An Address
ON
THE ANALYSIS OF LIVING MATTER THROUGH ITS REACTIONS TO POISONS.

Delivered to the Physiological Section of the British Association for the Advancement of Science, at Newcastle-on-Tyne,

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I AM told that the chair of Section I. has not been held by a pharmacologist for many years, and I wish to express the pleasure I feel in the honour that has been done me personally, and even more in the recognition vouchsafed to one of the youngest handmaidens of medicine. Pharmacology has too often shared the fate of the bat in the fable; when we appeal for support to the clinicians we are told that we represent an experimental science, while when we attempt to ally ourselves with the physiologists we are sometimes given the cold shoulder as smacking too much of the clinic. As a matter of fact, we should have a footing in each camp, or, rather, in each division of the allied forces. And the more recent successes in the application of pharmacology to diseased conditions are now beginning to gain it a rather grudging recognition from clinicians, while the alliance with the biological sciences is being knit ever more closely. The effect of chemical agents in the living tissues has assumed a new and sinister aspect since the enemy has resorted to the wholesale use of poisons against our troops, but I must leave this for the discussion to-morrow.

THE CHEMISTRY OF LIVING MATTER.

I wish to-day to discuss an aspect of pharmacological investigation which has not been adequately recognised even by the pharmacologists themselves, and which it is difficult to express in few words. In recent years great advances have been made in the chemical examination of the complex substances which make up the living organism, and still greater harvests are promised from these analytic methods in the future. But our progress so far shows that while general principles may be reached in this way, the chemistry of the living organ, like the rainbow's end, ever seems as distant as before. And, indeed, it is apparent that the chemistry of each cell, while possessing general resemblances, must differ in detail as long as the cell is alive. No chemistry dealing in grammes, nor even microchemistry dealing in milligrammes, will help us here. We must devise a technique dealing with millionths to advance towards the living organism. Here I like to think that our work in pharmacology may perhaps contribute its mite; perhaps the action of our drugs and poisons may be regarded as a sort of qualitative chemistry of living matter. For chemical investigation has very often started from the observation of some qualitative reaction, and not infrequently a good many properties of a new substance have been determined long before it has been possible to isolate it completely and to complete its analysis. For example, the substance known now as tryptophane was known to occur in certain substances and not in others long before Hopkins succeeded in presenting it in pure form. And in the same way it may be possible to determine the presence or absence of substances in living tissues, and even some of their properties, through their reaction to chemical reagents, that is, through the study of the pharmacology of these tissues. A simple example may render the point clearer. It is possible that if the toxicity of the saponins to different cells were accurately known, the relative importance of the lecithins in the life of these cells might be estimated, and this might give a hint to the chemist in approaching their analysis. I do not claim that pharmacological investigation can at present do much more than the qualitative testing of the tyro in the chemical laboratory, but even a small advance in the chemistry of living matter is worthy of more attention than this has received hitherto.

All forms of living matter to which they have free access are affected by certain poisons, and some of these have obvious chemical properties which suggest the method of their action; thus the effects of alkalies and acids and of protein precipitants hardly need discussion. Others such as quinine and prussic acid, which also affect most living tissues, have a more subtle action. Here it is believed that the common factor in living matter which is changed by these poisons is the ferments, and quinine and prussic acid may therefore be regarded as qualitative tests for the presence of some ferments, notably those of oxidation, and, in fact, have been used to determine whether a change is fermentative in character or not. Formaldehyde was stated by Loew to be poisonous to living matter through its great affinity for the NH_2 group in the proteins, a suggestion which has perhaps not received enough attention of late years, during which the importance of this group in proteins has been demonstrated. The toxicity of other general poisons, such as cocaine, is more obscure. But what has been gained already in this direction encourages further investigation of the action of the so-called general protoplasm poisons and further efforts to associate it with the special constituents of the cell.

BODIES ACTING ON THE NERVOUS SYSTEM.

In other poisons the action on the central nervous system is the dominating feature, and among these the most interesting group is that of the simple bodies used as anæsthetics and hypnotics, such as ether, chloroform, and chloral. The important use of this group in practical medicine has perhaps obscured the fact that they act on other tissues besides the central nervous system, though we are reminded of it at too frequent intervals by accidents from anæsthesia. But while they possess this general action, that on the nervous tissues is elicited more readily. Not only the nerve cell, but also the nerve fibre reacts to these poisons, as has been shown by Waller and others. And even the terminations are more susceptible than the tissues in which they are embedded, according to the observations of Gros. The selective action on the nervous tissues of this group of substances has been ascribed by Overton and Meyer to the richness in lipoid substances in the neurons, which leads to the accumulation of these poisons in them, while cells containing a lower proportion of lipoid are less affected. In other words, Overton and Meyer regard these drugs as a means of measuring the proportion of lipoids in the living cell. This very interesting view has been the subject of much discussion in recent years, and, in spite of the support given it by several ingenious series of experiments by Meyer and his associates, no longer receives general acceptance. Too many exceptions to the rule have to be explained before the action of these bodies can be attributed wholly to their coefficients of partition between lipoids and water. At the same time the evidence is sufficient to justify the statement that the property of leaving water for lipoid is an important factor in the action of the bodies, although other unknown properties are also involved in it. And whatever the mechanism of the characteristic action, these substances in certain concentrations may be regarded as tests for the presence of nervous structures and have been employed for this purpose.

Other bodies acting on the nervous system have a much narrower sphere. Morphine and strychnine, for example, appear to be limited to the region of the nerve cells, but there is still doubt whether they affect the cell body alone or the synapses between certain of its processes. They have not been shown to act on peripheral nervous structures in vertebrates, nor on any but specific regions of the central nervous system. Nor has it been established that they affect invertebrates. The substance with which they react is obviously limited by very narrow boundaries around the nerve cell.

More interest has been displayed in recent years in the alkaloids which act on the extreme terminations of various groups of nerves. These are among the most specific reagents for certain forms of living matter which we possess. Thus, if an organ reacts to adrenalin we can infer that it contains the substance characteristic of the terminations of sympathetic fibres with almost as great certainty as we infer the presence of a phenol group from the reaction with iron. And this sympathetic substance can be further analysed into two parts by means of ergotoxin, which reacts

with the substance of the motor sympathetic ends, while leaving that of the inhibitory terminations unaffected. Similarly, the endings of the parasympathetic nerves are picked out with some exceptions by the groups represented by atropine and pilocarpine, and here again there must be some definite substance which can be detected by these reagents.

Further, some light has been thrown on, at any rate, one aspect of these nerve-end substances by the observation that they all react to only one optical isomer in each case. Thus, the dextro-rotatory forms are ineffective in both atropine and adrenaline, and this suggests strongly that the reacting body in the nerve ends affected by these is itself optically active, though whether it bears the same sign as the alkaloid is unknown. This very definite differentiation between two optical isomers is not characteristic of all forms of living matter. For example, the heart muscle seems to react equally to both lævo- and dextro-camphor. The central nervous system contains substances which react somewhat differently to the isomers of camphor and also of atropine, but the contrast is not drawn so sharply as that in the peripheral nerve ends.

Another test alkaloid is curarine, the active principle of curare, which in certain concentrations selects the terminations of the motor nerves in striated muscle as definitely as any chemical test applied to determine the presence or absence of a metal.

RELATIONSHIPS IN REACTIONS OF DIFFERENT TISSUES.

The tyro in the chemical laboratory is not often fortunate enough to be able to determine his analysis with a single test. He finds, for example, that the addition of ammonium sulphide precipitates a considerable group of metals, which have then to be distinguished by a series of secondary reactions. The pharmacologist, as an explorer in the analysis of living matter, also finds that a single poison may affect a number of structures which appear to have no anatomical or physiological character in common. But as the chemist recognises that the group of metals which react in the same way to his reagent have other points of resemblance, so perhaps we are justified in considering that the effects of our poison on apparently different organs indicate the presence of some substance or of related substances in them. A great number of instances of this kind could be given, and in many of these the similarity in reaction extends over a number of poisons, which strengthens the view that the different organs involved have some common reacting substance.

One of the most interesting of these is the common reaction of the ends of the motor nerves in striated muscle and of the peripheral ganglia of the autonomic system. It has long been known that curare and its allies act in small quantities on the terminations of the motor nerves in ordinary muscle, while larger amounts paralyse conduction through the autonomic ganglia. More recently it has been developed by the researches of Langley that nicotine and its allies, acting in small quantities on the ganglia, extend their activities to the motor ends in large doses. Some drugs occupy intermediate positions between nicotine and curare, so that it becomes difficult to assign them to either group. These observations appear to leave no question that there is some substance or aggregate common to the nerve ends in striated muscle and to the autonomic ganglia. As to the exact anatomical position of this substance, there is still some difference of opinion. Formerly it was localised in the terminations of the nervous fibres in the muscle and ganglia, but Langley has shown that in the latter the point of action lies in the ganglion cell itself, and his researches on the antagonism of nicotine and curare in muscle appear to show that the reacting substance lies more peripherally than was supposed, perhaps midway between the anatomical termination of the nerve and the actual contractile substance. Another analogy in reaction has been shown to exist between the ganglia and the terminations of the post-ganglionic fibres of the parasympathetic, for Marshall and Dale have pointed out that a series of substances, such as tetramethyl-ammonium, affect each of these in varying degrees of intensity. The specific character of the reaction is shown by the fact that while it is possessed by the tetramethyl-ammonium salts, the tetraethyl-ammonium homologues are entirely devoid of it.

Another close relationship is shown by the reaction of the glucosides of the digitalis series on the heart and vessels. These all act on the muscle of the heart, and in higher concentration on that of the vessel walls. There must, therefore, be a common base in these which is affected by the drugs. And the existence of this is perfectly intelligible in view of the fact that the heart is developed from the vessels. A more obscure relationship is shown by the reaction of this group to the inhibitory cardiac centre in the medulla, which is thrown into abnormal activity by their presence in the blood, as has been shown alike by clinical and experimental observations. A similar relation is shown by the common reaction of the heart muscle and the vagus centre to aconitine and some other related alkaloids. On the other hand, the saponin series, which shows a closer relationship to the digitalis bodies in the heart muscle, is devoid of its characteristic action on the medulla. The reacting substance in the heart is thus capable of responding to digitalis, saponin, and aconitine, while that in the vagus centre can associate only the first and last and is not affected by the saponins; the common reactions indicate that the two are related, while the distinctive effect of saponin shows that they are not identical. A similar relationship may be drawn from the action of morphine and the other opium alkaloids on pain sensation, on respiration, and on the movements of the alimentary tract. Exact determinations of the relative power of these alkaloids in these regions are not at our disposal as yet, but sufficient is known to suggest that while morphine affects a common substance in the medullary centre and the intestinal wall, the other members of the series act more strongly in one or other position.

It was long ago pointed out that caffeine affects both kidney and muscle cell, and Schmiedeberg has attempted to correlate the intensity of action of the purine bodies at these points and to measure the probable diuretic action by the actually observed effect on the contraction of muscle. Other reactions of the kidney suggest a relationship to the wall of the bowel. For example, many of the heavy metals and some other irritant bodies act strongly on the kidney and bowel, and again, according to one view of renal function, many of the simple salts of the alkalies affect the kidney in exactly the same way as the bowel wall. This last may, however, be due to the physical properties of the salts, and the likeness in reaction to those of kidney and bowel, which is striking enough, may arise rather from a likeness in function of the epithelium rather than from any specific relationship to the salts which is not common to other forms of living matter.

INTERPRETATION OF REACTION IN COMMON.

Many other examples might be cited in which organs which are apparently not related, either morphologically or in function, react to poisons in quantities which are indifferent to the tissues in general. And this reaction in common can only be interpreted to mean that there is some substance or group of related substances common to these organs. The reaction may differ in character; thus a drug which excites one organ to greater activity may depress another, but the fact that it has any effect whatever on these organs in preference to the tissues in general indicates some special bond between them, some quality which is not shared by the unaffected parts of the body. I have, therefore, not differentiated between excitation and depression in discussing this relation. One is tempted to utilise the nomenclature introduced by Ehrlich here and to state that the common reaction is due to the presence of haptophore groups, while the nature of the reaction (excitation or depression) depends on the character of the toxophore groups. But while these terms may be convenient when applied to poisons whose chemical composition is altogether unknown, they merely lead to confusion when the question concerns substances of ascertained structure. Thus, as Dale has pointed out, it is impossible to suppose that such substances as tetramethyl-ammonium and tetraethyl-ammonium owe the difference in reactions to specific haptophore groups in the one which are absent in the other. It seems more probable that in this instance and in others the difference in the effect of these bodies in the tissues arises from differences in the behaviour of the molecule as a whole than in differences in the affinities of its special parts; that is, that the action of these poisons is due to their physical properties rather than to their chemical

structure, although this, of course, is the final determining cause.

In the same way the common reaction of tissues, which I have so far ascribed to their possessing some substance in common, may arise from community of physical relationship, and I wish to avoid the implication borne by the word "substance," which I have used in the widest sense, such as is justified perhaps only by its historical employment in theological or philosophical controversy. The reaction of living tissue to chemical agents may arise from a specific arrangement in its molecule, but may equally be attributed to the arrangement of the molecules themselves. And the curious relationships in the reactions of different tissues may indicate, not any common chemical factor, but a common arrangement of the aggregate molecules. We are far from being able to decide with even a show of probability which of these alternatives is the correct one, and my object to-day has been to draw attention to these relationships rather than to attempt their elucidation. Hitherto the speculative pharmacologist has been much engaged in comparing the chemical relationship of the drugs which he applies to living tissues; much useful knowledge has been incidentally acquired, and the law has been formulated that pharmacological action depends directly on, and can be deduced from chemical structure. This view, first elaborated in this country, has in recent years shared the fate of other English products in being advertised from the housetops and practically claimed as the discovery of more vociferous investigators. On examining the evidence, old and new, one cannot help feeling that attention has been too much directed to those instances which conform to the creed, while the far more numerous cases have been ignored in which this so-called rule fails. The difficulties are very great; for example, what chemical considerations can be adduced to explain why the central nervous tissues react differently to bromide and chloride, while to the other tissues these are almost equally indifferent; or how can the known chemical differences between potassium and sodium be brought into relation with the fact that they differ in their effects in almost every form of living tissue?

Less attention has been paid to the other factor in the reaction, the properties of the living tissue which lead one cell to react to a poison, while another fails to do so. I have pointed out some curious relations between different organs, but much needs to be done before any general view can be obtained. Further detailed examination of the exact point at which poisons act, and much greater knowledge of the physical characters of the drugs themselves and of the relation of colloid substances to these characters, are needed. We must attempt to classify living tissues in groups not determined by their morphological or even functional characters, but by their ability to react to chemical agents. Advance is slow, but it is continuous, and if no general attack on the problem is possible as yet, our pickets are at any rate beginning to give us information as to the position of the different groups to be attacked. And when a sufficient number of these qualitative reactions have been ascertained for any form of living matter, it may be possible for some Darwin to build a bridge from the structural chemistry of the protein molecule to the reactions of the living cell. We can only shape the bricks and mix the mortar for him. And my purpose to-day has been to indicate how the study of the effects of drugs on the living tissue may also contribute its mite towards the great end.

CENTENARIANS.—Miss Martha Trenear, of St. Just in Penwith, died on August 13th. She celebrated the hundredth anniversary of her birthday on Feb. 28th last.—Mrs. J. Trueman recently died at Bristol in her 102nd year.

EDINBURGH FACULTY OF MEDICINE: THE ADMISSION OF WOMEN.—At a special meeting of the Edinburgh University Court on August 28th the report of the committee appointed on July 10th to consider the admission of women to the medical faculty came up for discussion. The Court resolved that, except in the cases of (*a*) materia materia and (*b*) midwifery and gynæcology, women students should be admitted to the lecture courses in every subject. Separate sections should be instituted for women in all practical courses, except in advanced courses and in special cases that may be arranged by the head of any department, subject to the approval of the Senatus. The provision of clinical teaching for women students by the University was reserved for further consideration.

CONTRIBUTIONS TO THE STUDY OF SHELL SHOCK.

BEING AN ACCOUNT OF CERTAIN DISORDERS OF SPEECH, WITH SPECIAL REFERENCE TO THEIR CAUSATION AND THEIR RELATION TO MALINGERING.

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LIEUTENANT-COLONEL, R.A.M.C. (T.C.).

IV.[1]

THE principal disturbances of speech which I have observed may be grouped under three heads—aphonia, dysarthria, and mutism. This is the order of frequency in which, from our experience of functional disorders in times of peace, such disturbances of speech might be expected to occur. But in the class of cases with which this war has familiarised us, (for reasons which we shall see later) the order is exactly reversed. Dumbness is by far the commonest disorder of speech, occurring in about 10 per cent. of all cases of shock which have come to my notice; I have met with affections of articulation, e.g., stuttering, or jerky speech, only in about 3 per cent.; while loss of voice, as the result of shock, is of somewhat rarer occurrence.[2]

Mutism.

Immediate causes.—For the present the immediate causes of mutism may be most conveniently grouped as (A) "physical," the patient having been lifted, buried, or knocked over by a shell, or having otherwise felt the effects (physical or chemical) of its explosion; and (B) "psychical," where, for example, the noise of the shelling has terrified him or a shell has burst near to him, horribly mutilating several of his comrades. Henceforth I shall, for brevity's sake, allude to cases of mutism by the letters A or B, according to their apparent origin. The relative frequency of the A and B cases is difficult to determine. Histories are not always easy to obtain; and some cases may belong to both groups, or apparently to A, though really to B. But my general impression is that the two groups occur with equal frequency.

Predisposing conditions.—In about one-third of the cases of mutism various predisposing affections may be demonstrated, e.g., "nervousness," "fits," stuttering, wounds, or exposure to the enemy's gas. These predisposing affections occur as often in the cases of group A as in those of group B. Mutism is not restricted to any one age. I have met with cases in men of 30, 40, and even 50 years. The average age of the cases of mutism I have seen is about 25 years. Mutism is extremely rare among commissioned officers. I have heard of one or two cases; but among the many officers I have seen I have not met with one so affected.

Immediate effects.—The usual direct result of the shock, as described to me by mute patients, is "loss of consciousness" or "loss of memory." I have seen only three cases in which complete preservation of memory was claimed; two of these were highly "nervous" subjects, of whom one had stammered formerly and the other had been subject to fits in childhood. It was, of course, difficult to decide whether a given patient had suffered from unconsciousness or merely from amnesia when I saw him after he had "come to himself"; but where, on the one hand, his condition appeared to have resulted from physical violence, or where, on the other hand, he had been able to walk down with assistance from the trenches, or had been affected with automatism (fugues), or was still preoccupied with the visual or auditory hallucinations of coming shells, a tolerably reliable decision seemed possible. Both loss of consciousness and loss of memory occur alike in groups A and B; but, as we should expect, unconsciousness appears to be commoner in group A, and amnesia in group B. I have little doubt that the amnesia complained of is almost always due to the onset of a semi-stuporose state, and that most cases of initial loss of consciousness are really the expression of, or, at all events subsequently pass into, a condition of confusion or stupor.

[1] The previous communications on this subject appeared in THE LANCET of Feb. 13th, 1915 (p. 316), and Jan. 8th (p. 65) and March 18th, 1916 (p. 608).

[2] This certainly held good for, say, the first thousand cases of shell shock which I saw. But of late relatively more cases of aphonia have come to my notice.

Stupor.—Indeed, a definite history of stupor is obtainable in a very large number of mute patients. Others were still in that condition at the time of my examination of them, staring vacantly into space and taking no notice of their surroundings. Stupor is apparently commoner in the B than in the A cases, but it does not seem specially prone to occur among those predisposed to shock. Of the varieties of stupor a detailed description may be deferred until I come to deal with this condition at some later date. But I may note that in this communication I have not classed a man as mute until his stuporose state has so far passed off that he is clearly capable of observing and reacting to his environment; being able to write or at least to gesticulate.

Onset of mutism.—As regards the speed and mode of the onset of mutism my records are unsatisfactory, no reliable information being usually obtainable on these points from the patients or from the medical officers of regiments or field ambulances. Most of the patients claim to have found themselves mute on "coming to." That is to say, their functional condition is "of unconscious origin"; whereas in the cases of mutism in which no loss of memory occurs it is probably often "of conscious origin."

The following is a typical history given in writing, but otherwise unsupported, by an A case. "A shell burst about two yards away; it lifted me up in the air. I don't know what happened afterwards. [When I came to myself] I was watching the trench mortars coming over and killing my mates, and I could not tell them [what was the matter], because I couldn't speak."

The following is an equally typical history of a B case, obtained from the patient's regimental medical officer. "It appears that he was in the trenches at ——, where he was subjected to heavy shelling one day. Several burst near him, one blowing in the dug-out and wounding several men. They were relieved two nights or so later and went into billets at ——. Whilst in a courtyard outside his billet a shell exploded in the yard and wounded several men, but he was not blown up in any way. He then cleared out to the billet of the other company. Here he was quite dazed, would answer no questions, and if any one came near him he would either jump at them or draw away."

In only a few cases was the onset late or gradual (see, for example, Cases 17 and 18, described below).

I have had opportunities of seeing cases of mutism at field ambulances and clearing stations—that is, within a very short time after the occurrence of the shock. They differ usually from those which I have seen (in greater numbers) at the base hospitals (*a*) in being more completely mute, (*b*) in being more intensely pre-occupied and more intolerant of suggestion. For example, one man, admitted as deaf-mute into a field ambulance, could be induced, when hypnotised, to react to my spoken order (viz., to put out his tongue), but thereupon he awoke and seemed as deaf and as "stupid" as before. Another mute, seen at a clearing station, could be made by post-hypnotic suggestion to pronounce his regimental number, but was found an hour later to be as completely mute, dazed, and dismal as on admission. A third mute was so preoccupied with thoughts and hallucinations of the shelling that it was quite impossible to obtain his attention for more than a few seconds continuously.

Degrees of mutism.—As I have just said, many of the men, seen soon after onset, were absolutely dumb. Most of those, however, whom I saw later, could be speedily induced to whisper consonantal sounds and sometimes vowels, while a few had so far progressed as to be able, with encouragement, to repeat in a whisper single monosyllabic words or even to reply (almost always monosyllabically) to questions. On the other hand, certain cases, including a few which I believe to have been partially malingering, stolidly maintained an absolute mutism when evacuated to England. I have not seen a case in which meaningless jargon was uttered. With very few exceptions mutes could be induced to cough. Whistling or forcible expiration was often impossible.

Deafness.—A considerable number of mutes give a history of initial deafness. Deafness is as common in the A as in the B group. In many cases it is clearly due to inattention, being part of the vacant, semi-stuporose, or pre-occupied condition of the patient. Such men can occasionally be made to hear, but fail to appreciate what is said to them. In others, especially in the A cases, the deafness appears due to diminished sensory acuity; aud in these there may have been recent aural discharge. Certain deaf-mutes, nearly all of them B cases, can be made to give an involuntary start on first hearing an unexpected noise, but not again; or they can be induced to carry out the first order addressed to them (e.g., to put out the tongue), but no subsequent order. This condition is generally associated with one of stolid stupidity, and with complete mutism. Deaf-mutes usually recover their hearing before their speech.

Other concomitants of mutism.—Stupor (with the defects which may be considered as part of this condition), amnesia, and deafness are by far the commonest concomitants of mutism. Besides these the following affections may be mentioned, in their order of frequency: muscular tremor, contracted visual fields, unsteady or incoördinated movements, defective cutaneous sensibility. I have not seen a case of functional hemiplegia or of hyperæsthesia associated with mutism. I have seen several showing choreiform, spasmodic, or "jumpy" movements at an early stage, in some of which, I believe, mutism developed from a previous stage of dysarthria. A very few cases give a history of vomiting. The pulse, when altered, is usually quickened and weakened. The patellar reflex is often exaggerated; it may be normal, but I have not seen a case of mutism in which it is sluggish. I have not examined the palatal reflex in many cases, but I have not yet found it absent in mute patients. The superficial reflexes of the abdomen and sole are often difficult or impossible to obtain. In a few of the severe cases fugues or hysterical fits occur at the outset; in other severe cases voluntary movement is slow, and handwriting is accomplished with difficulty; but, as a rule, writing is easy, and the mute patient is eager to describe on paper his experiences—as far as he can recollect them—ending typically with the expression of a wish that he may soon regain his speech.

Experiences of mutes when trying to speak.—In fully 25 per cent. of the cases reference is made by the patient to discomfort or pain in the throat, the complaint being that "with each attempt something grips me at the sides of the neck," that "my throat is sore," "tickles" or "pains"; a few refer to inability to move the tongue freely (although they can nearly always protrude it), "something holding my tongue at the back," "my tongue seems to stick," "it curls up at the tip," &c. Now and again this had occurred during the mental strain just preceding the final breakdown.

Some patients make the most violent grimaces on attempting to imitate the sounds of consonants. Not infrequently they complain of headache, "drumming in the head," or "dizziness" when they try to talk. One of my cases remarked, "I seem silly when I try to talk"; since wounded previously, he had been subject to hysterical fits. I have not met with any instances of paralysis of the parts concerned in articulation, although their movements may be restricted or clumsily executed.

Recovery from mutism.—In over 75 per cent. of the mute patients I have seen their improvement was rapid, the B cases (especially those whom I knew to have passed through a stage of stupor and to be free from any suspicion of malingering, whose mutism was of "unconscious origin") recovering much more rapidly than the A cases. The majority were cured by simple encouragement, persuasion, and suggestion, aided or unaided by hypnosis; some were cured by an anæsthetic, a few recovered their speech spontaneously, and a few did so after being harshly reprimanded and isolated from other patients. One patient began to speak spontaneously six hours after the administration of chloroform had failed to effect a cure. A small proportion (about 24 per cent.) of the cases were unavoidably sent mute to England, where no doubt they have all since recovered.

When speech returns after mutism it is often laboured or hesitating, more rarely whispered or stuttering, but these defects almost always disappear rapidly. Sometimes the voice is temporarily altered in character, one patient, for example, not recognising it as his own for a few days.

Those who recover spontaneously do so either on waking from sleep or through some unusually powerful or sudden motive for verbal expression. Such cases have often been previously heard to talk in their sleep.

In curing mutism by persuasion I have found the following to be a successful procedure. In the first place, I assure

the patient that I have already cured many cases of loss of speech by the method I am about to adopt in his case. Next, I ask him each time to copy me as I successively make the sounds (not the accompanying vowels) of B, D, and finally of V, S, K. In by far the majority of my cases I have soon been able to induce the patient to make the necessary movements of the lips, tongue, or throat for the production of these sounds. Then I encourage the patient thus: "You see you are beginning to talk. Now let me hear you cough." After he has done so I say, "You see, you are able to make a noise. I want you next to cough out an A [continental pronunciation.]" After a few trials the patient is usually able to add this vowel to the end of his cough, whereupon I proceed to teach him other vowels, finally prefixing a consonant instead of a cough to the vowel, and making him vocalise Ba, Di, So, &c. By this time he is delighted with, and assured of, his progress towards recovery, and it is comparatively easy to get him to combine monosyllables together so that he can repeat after me his surname and regimental number.

The employment of an anæsthetic was first suggested to me by Captain E. T. C. Milligan, R.A.M.C., who had successfully used it at a clearing station. Recovery should be expected during the stage of excitement preceding true anæsthesia. I remember one patient who began to speak after he had had only two or three "whiffs" of chloroform. I have already mentioned another in which recovery occurred some hours after the administration of the anæsthetic. These cases are instances in which the excitement occasioned by the procedure proved in itself an adequate stimulus. On the other hand, I have anæsthetised some mute patients who have passed into a condition of deep anæsthesia without becoming excited, and did not subsequently regain their speech despite strong verbal suggestion, face-slapping, skin-pinching, &c., applied before the complete loss and during the recovery of consciousness. I have also met with cases in which, although speech returned with the aid of suggestion during the stage of excitement, a relapse to mutism occurred when the effects of the anæsthetic had passed away.

Where simple suggestion and encouragement are only imperfectly successful, a complete cure may often be made by recourse to hypnosis. The following cases may be cited as examples.

CASE 17 (Case-number 575).—Sergeant, (actually) aged 18, with 19 months' service, and 11 months' service in France, seen by me on admission to a clearing station to which he had been transferred after three days' stay in another clearing station. The latter clearing station was situated in the town of B—— near the front, and the officer in charge transferred the patient with the following particulars: "On the day of admission he was found in the streets of B—— asking his way to the fire trench. Could not be got to speak on admission, nor since; seems deaf, but now writes rationally."

On admission to the second clearing station he was at first quite mute and very deaf, but his deafness at once improved on my talking encouragingly to him, and I could soon induce him to cough and to utter the sounds of P, B, F, S, and gradually to whisper, very imperfectly, his name, regimental number, &c. He could write fluently, and wrote that he had no recollection of what had happened to him after being buried, until he found himself at the cross roads in B—— asking the way of a military policeman. Then he "lost" himself again and remembered no more until he had been 48 hours in the clearing station at B——.

He complained that when he tried to speak, his throat hurt as if it were pulled down, and that when he tried to recall the past his head ached. He was very tremulous, especially in the right arm.

He was then taken into a quieter adjoining room, where his tremors at once increased and he became greatly agitated. But I was able to allay his very obvious fears by suggestions of a cure and by encouragement, and ultimately I induced a mildly hypnotic state in which for the first time he began to speak aloud, at the outset with hesitation, but later fluently. He claimed to have no memory of what had happened after being buried (on the night before his arrival at B——) when he was alone in the dark with his telephone wires. Then after persuasion he began to remember that when he had extricated himself he ran, as he thought, towards the fire trench, but taking the wrong direction he found no one in it. Giddy, terrified, and in pain (he had been buried by 3 feet of earth), he found his way to a road, by which time he was scarcely able to walk. He remembered that he met a Frenchman, who helped him to his cottage, gave him eggs and bread, and allowed him to sleep on a couch, putting him on a cart at dawn and driving him "a long way" to the outskirts of B——. At B—— he could hardly see owing to extreme "giddiness," when he spoke to the policeman. He said that he was "terribly shaken" by the shell (a "coal-box"), and still more so when he found the fire trench empty.

I gave him suggestions that on waking his headache (already dissipated by suggestion during hypnosis) would not recur, and that on returning to the ward from which he had been brought he would shake hands with the orderly and tell him how glad he was to be well again (which he did without knowing why). On waking he was delighted at his recovery and talked in a good loud voice, perhaps at first a little hesitatingly. His face, previously clay-coloured, assumed its normal aspect, and he looked, as the orderly well said, "another man."

He had a good night's sleep and was evacuated the next day to a base hospital and thence to a hospital in England, from which he wrote 16 days later, of his own accord, to thank me for the successful treatment he had received, adding that save for a shakiness of his hands he was nearly well, and hoped soon to be fit for light duty. Six weeks afterwards, in reply to my inquiries, he wrote me that he was still "dizzy" and unsteady, that he had never previously met with men who had lost their speech, had never been afraid of losing his speech, had never stammered as a child, and had "always been possessed of good nerves." He could now recall nothing after being driven into B—— (save giving his address to a chaplain) until he found himself at the second clearing station. He remembered, however, losing his way in the front lines, wandering into a listening sap, where he found himself "in front of the Huns' barbed wire," and "having a bit of a tussle with three Huns at close quarters," on his way back from which he was buried during heavy shelling.

CASE 18 (Case-number 422).—Private, aged 21, with 14 months' service and seven months' service in France, seen by me the day after admission to a base hospital suffering from mutism of over six weeks' standing. His regiment had been heavily shelled when in support during an important attack. He did not go into the fighting line, but the severe shelling upset him. "My nerves got the better of me, I cried, and my speech got worse and worse." He was taken down to the first-aid post, where and at the field ambulance he could speak a little, but after that he rapidly became quite mute. He had since spent five weeks at a convalescent camp, where, despite motor drives, frights, and promises, he made no progress. He worked well at the camp and was then sent to work at the base, whence he was transferred to a base hospital.

He was in an extremely nervous state when I saw him, breathing very rapidly, but with a not very rapid pulse-rate (of 90). He could be induced to cough, and soon imitated vowels and the noise of consonants, but could not successfully combine vowel and consonantal sounds. He showed no defects of sensibility; visual fields normal. Pupils large, reacting poorly to light. No nystagmus. Conjunctival reflex feeble; corneal and palatal reflexes normal. Knee-jerks brisk. Other reflexes not examined.

Two days later he had improved considerably. He told me that he always used to stutter when excited, and was always nervous, so much so that his mother had induced him to give up his sergeant's stripes as he was not expected to be fit for a responsible position under fire.

The next day, under hypnosis, he was able to talk far better. He told me more about his experiences, of which he had before been very "hazy," and could be made to repeat "Peter Piper picked a peck of pickled peppers" with fair speed and accuracy. His voice, however, had a peculiar droning, monotonous character.

He was sent to England, and a month later was discharged from hospital there. Two months after this he wrote me: "My speech has improved greatly, and it is only when anyone in authority speaks to me I seem to lose control of myself and ..... start and stammer, but I hope soon to be able to conquer both my nerves and my speech. ..... It is very dreary here (in a depot), but I hope to progress better when I get back to my unit."

By written suggestions I have hypnotised a few cases of deaf-mutism, but in only one case have I succeeded in dispelling the deafness during hypnosis. The patient, however, awoke immediately, mute and again deaf. I have had some promising success by employing lip-reading, in suitable cases, which is often learnt with a rapidity clearly indicating the "functional" character of the deafness. But my experience is that until their deafness has disappeared (which occurs in course of time) it is difficult or hopeless to attempt to cure mutism in such patients.

The recovery of speech often causes great excitement in the patient, and may even induce a hysterical crisis, as in the following case:—

CASE 19 (Case-number 153).—Private, aged 28, seen by me on admission to a base hospital, suffering from deaf-mutism.

He wrote: "I was standing and a shell bursted and that is all I can remember." He thought it had occurred at R—— six days previously, and wrote vaguely about a walk (date unknown) from H—— to "Windy Corner," where he was billeted in a dug-out, about a train journey, and about being in another hospital at C——. He was found to be quite deaf and very deficient in sensibility to superficial and deep prick and to light touch, especially on his left arm and on the left side of his face. He complained of severe headache. No limitation of visual fields. Movements normal.

Two days later his condition was unchanged, but he distinctly started when I clapped my hands while he was occupied in writing for me. The next time I clapped there was no response. I wrote down, "Imitate me." I began by making the sounds of consonants, which at length he succeeded in imitating fairly well. Then I uttered the sound A (continental pronunciation), which he reproduced as Ba, and other syllables, separately and in combination, which he repeated correctly. "You hear me a little now," I wrote; "Is this the first time you have spoken?" He wrote in reply, "I hope the Lord I can get my speech." "But you *did* speak to me just now," I urged; "Read this word, say it," I wrote, showing him his written name (of two syllables). I also got him to say his number. His speech was slow and rather stammering, but he still appeared not to realise that he had recovered his speech. I was proceeding to convince him that he could now speak and hear me, when suddenly he stretched out his arms and was seized with convulsions, the limb movements being for the most part clonic, with his back arched, and the eyes at first staring, later upturned. Reaching towards the locker beside his bed, he pulled out a crucifix which he held at arm's length and regarded with an ecstatic gaze. Pulse 85; corneal reflex active throughout. At length, after about three minutes, he became quieter, and, although still very agitated, could be induced to talk. His first words on recovery from the attack were about his wife. Then he told me that he had been "seeing a farm and all the fighting." He thought that a shell must have come in there. He had also "seen the Lord Who saved" him. He could not recollect having seen me before, but the faces of his neighbours in the ward seemed familiar to him. At first he insisted that he was still at the farm, and every now and again he tended to pass into a convulsive state. He complained of intense headache and thirst, and later explained that his excitement was due to his recovery of speech.

On the following day he told me that he had no recollection of my trying to get back his speech, and that he could not recall seeing me before he came to himself. "It was just like a dream when I came to. I was sweating awful. I was seeing the Lord, while I was in the farm by the captain. I dreamed that I had the Cross in my hand to meet Him coming. I saw the trenches and the dug-outs and the wife." He remembered that at the farm where he had been with trench mortars he had gone to see his captain, whose arm had just been blown off. He found him lying on the straw unconscious. He came to himself, he said, on a stretcher at a dressing station. Under hypnosis I was able to get little additional information. From the farm he appeared to have gone to a dug-out. He believed that at the clearing-station he was "raving, seeing things, shells, trenches, and things like that, Sir." He had a vague recollection of the train journey to the base, and his admission to the hospital here.

He was evacuated to England, where he made a slow recovery. He returned to the front seven months later.

Conditions determining recovery from mutism.—The youngest patients appeared to regain their speech rather less rapidly than the oldest. The B cases recovered more readily than the A cases, the predisposed rather more readily than those not predisposed, the stuporose cases more readily than those in which stupor had not been observed, in certain of which some degree of malingering doubtless played a part.

The methods of treating mutism which I have described may be broadly described as "psycho-therapeutic." For a successful issue they should be employed neither too soon nor too late after the onset of the condition. The obstinate cases of which one receives accounts from England are no doubt partly due to the ineffectiveness, or lack, of earlier treatment, which has thus allowed the processes of inhibition at work to become systematised into a habit difficult to cure. I have already pointed out the difficulties of dispelling mutism by suggestion too soon after the shock. The same holds for the tactless administration of an anæsthetic. I remember a case of shell-shock admitted immediately after onset into a casualty clearing station in a maniacal condition. Two days later he had become quite quiet and had written an intelligent history of his condition, but was mute. An anæsthetic was given, and he spoke while under its influence, but not subsequently. Two days after this an anæsthetic was again given. As before, when "going under," he swore and shouted loudly about British pluck and the Germans. But on discontinuing the anæsthetic he passed into a deep sleep, from which it was impossible to rouse him. A few more whiffs of the anæsthetic were then given, and the words "German shells" were uttered in his ear. He was immediately seized with the most violent convulsions, which rapidly passed into powerful efforts to get out of bed and to fight the imaginary Germans. Five men could hardly restrain him. Ultimately he sank back exhausted, assuming his previous condition of almost complete mutism.

After-history of mute cases.—Of 12 cases of which I obtained some after-history, only one appeared to be doing well with his regiment at the front; two others whom I returned apparently fit to duty reported sick repeatedly with trivial ailments, until at length they succeeded in coming into hospital again. Of the nine who were transferred to hospital in England (only two of whom were mute on leaving France), two were readmitted to hospital after previous discharge to duty, one collapsing while on guard in England, nine months after the onset of mutism, the other developing dizziness and fits; three were still unfit for duty after four months; two, though on light duty after three months, and two, though on duty after seven months' treatment, had not completely recovered from shock. Several of the patients protested to me that they had "received no treatment" in England—a complaint condemning the policy of mere rest or *laisser aller* to the exclusion of more active and continuous persuasive or disciplinary measures.

Causation of mutism.—The first question of importance is whether there are two forms of mutism—the one due to the effects of actual concussion or gas fumes, the patient having been lifted, buried, knocked over, or otherwise immediately exposed to the explosion of a shell, and the other due to horror from some shocking sight or to terror from the heavy bombardment. There cannot be the slightest hesitation in giving a definite answer to this question.

There is no reason whatever to suppose that whereas mutism in the B cases is due to functional inhibition arising from mental shock in the A cases it is immediately due to minute hæmorrhages or to gas poisoning.

The A and the B cases present precisely the same features of mutism, just as when dealing with disorders of cutaneous sensibility we found they presented similar features of hyperæsthesia and anæsthesia. As would be expected, mutism in the A cases (where the shock must have been grosser and more profound) generally proves more severe than in the B cases, and, as we have just seen, the less resistant subjects—e.g., the predisposed patients—are more prone to mutism and more readily recover from it. We may conclude, then, that whether mutism occurs as the *apparent* result of physical, chemical, or of mental causes—i.e., as an A or a B case—it is *actually* always the result of mental—i.e., psycho-physiological—shock.

The next question concerns the relation of mutism to stupor. I am unable to produce evidence that those mutes who have at once been rendered unconscious, through fainting or through being buried or lifted by a shell, pass into a state of stupor before recovering. But I believe that this was the case in at least the large majority of my patients. Indeed, I have only the patients' account that they "lost consciousness." Extremely few cases have come down to me with an official note of true unconsciousness. There is hence a strong presumption that most, if not all, of the cases of alleged prolonged unconsciousness were really due to deep stupor. I have thus come to regard mutism as in nearly every instance closely dependent on some form of stupor, mild or severe, momentary or lasting, and as being generally a relic of that condition after it has passed off

Where, in cases of mutism, loss of consciousness has occurred through the patient being lifted or buried, it is, in my opinion, sooner or later an expression of the most profound stupor, in which all cerebral activity is inhibited save those processes that are essential for the continuance of life. From this stage there is a transition to one of ordinary stupor where, although the patient's intelligence is clearly active, he is still absolutely unresponsive to the external world. The inhibitory processes, producing such excommunication, may be regarded as protecting the individual against further shock. (So, too, the pain or discomfort in the throat or tongue, or the severe headache, evoked by the mute's efforts to speak, tends to preserve the condition

of mutism.) As the stupor passes away, what is more natural than that inhibition should disappear last in the case of hearing and speech, the two main channels of intercourse with others? Thus we may account for the surprising frequency of mutism, compared with the other disorders of speech. With few exceptions, mutism is a functional disorder of "unconscious origin," whereas aphonia is commonly, and dysarthria occasionally, a functional disorder of "conscious origin."

I have not found any evidence pointing to the necessary dependence of mutism on suggestion. Various *a priori* views are possible. We may argue, in the manner of Babinski, that whatever can be cured by suggestion must have been produced by suggestion. We may suppose that a patient, afflicted with mutism, had previously heard of the likely onset of mutism after shock, or that he had already had some disorder of speech (e.g., stammering) in his forgotten youth, or that, on recovery after being knocked down by a shell, he had spoken to a comrade, when, amid the din of bombardment, he could not hear himself talk nor hear what was said to him by others; hence through suggestion, conscious or unconscious, from within or without—through "auto-" or "hetero-" suggestion,—the onset of mutism.

But stupor, to which, as I have urged, mutism is, as a rule, closely related, is the very antithesis of a state of suggestibility; it is a condition of extreme "auto-fixity" in which the patient is totally impervious to impressions from without. His field of consciousness has been narrowed by the shock in such a manner that, instead of responding easily to suggestion, as happens when a person's attention has been fixed and his field of consciousness narrowed during the process of hypnosis, he is absolutely cut off from the external world, as happens in the state of fixed attention and narrowed field of consciousness induced through religious ecstasy. In bringing about the latter condition it is perfectly obvious that suggestion plays no part. So, too, it plays no part in producing mutism or stupor where the patient has undergone a severe mental shock, but has never suggested to himself that he shall lose all contact with, and yield no response to, his environment.

The tendency already described of early cases of mutism to revert to a stuporose state after momentary improvement is another indication of the close relation between mutism and stupor. This relation is further well shown in the following case, which also explains the momentary lapses from deafness in deaf-mutism to which allusion has already been made.

CASE 20 (Case-number 465a).—Stretcher-bearer, seen by me two days after admission to a base hospital. He was a stolid-looking youth. Although mute, he had been heard to talk in his sleep; he could be induced to write a few words about "shells coming over"; he understood on admission what was said to him. When first I saw him, my notes run, "He puts out his tongue and closes his eyes, and holds out one hand when I ask him to do so, but gets stupid (as if sulky) when I ask for the other hand. He *will* not hear any more." On the following day he appeared quite deaf. The day after that he was lightly anæsthetised with ether, whereupon his hearing at once returned, he put out his tongue to order, and he began to talk, repeating syllables spoken to him and counting to order one, two, three, &c., as he passed into deeper anæsthesia. On waking he cried as he was induced to resume his speech, and complained of pains in the head.

Two days after he seemed quite normal, and he admitted to me that he could have spoken on the second day after his admission to the hospital. He attributed his behaviour when I first saw him to the fact that his "eyes and ears began to swim," and that he "felt dizzy." He said that he was "afraid to talk" and that he did not want to be sent back to the trenches. He described to me the severe shelling to which he had been exposed, and said that after the shells had burst he lost consciousness until he awoke in hospital at Y——. By further persuasion I induced him to recall little by little how he had been taken by a corporal to the cellar of a school after the shells had burst in the garden of his billet at Y——. I then asked him what he would like to do. He replied that he had excellent chums at the front and had been preparing for a jolly Christmas. "I would rather go back," he said, "but would like a rest here first." He had no home in England, as his uncle, with whom he had worked, was serving now in France. He returned to his unit, where, I am informed by his medical officer, he has been for four months and is "doing well, ... and never comes sick."

Mutism and malingering.—The above case is also valuable for the light it throws on the relation between mutism and malingering. The lad admitted that he could have spoken before he was induced to do so. There is no reason to believe that he was not genuinely mute from the start, and for my own part I do not believe that he was truly malingering at the end. The inhibitory effects of the mental shock were slowly passing off after their onset, and it was only a matter of time until they were overcome altogether. I have met with other patients who, on recovering their speech, told me that a few days before they actually talked they had felt that they would soon be able to do so. I recall the case of one man who, after having had his speech restored by faradisation of the throat (aided by strong suggestion), told me that as soon as he met the doctor he "at once saw that he had great will power" over him. Such patients are apt falsely to believe that they have been malingering.

On the other hand, cases occur like the following, in which there is graver doubt as to the absence of malingering:—

CASE 21 (Case-number 423).—Private, (actually) aged 18¾, with six months' service and four months' service in France, was admitted to a base hospital seven weeks after the onset of mutism. He was a healthy-looking lad of stubborn demeanour, refusing to make any sound or whisper, or even to cough; and a few days after his admission he wrote a note of complaint to the medical officer about his treatment in hospital. He showed no defects of sensation and no other signs of shock. I saw him five days after his admission, and after giving him a stern reprimand ordered him to be isolated from the other patients in solitary confinement, to be deprived of cigarettes, and to be given milk diet. The very next morning he regained his speech. He attributed his recovery to a dream in which he thought he was at home with his mother, who had received the tidings that his two brothers had been killed at the front. He said that he dreamed that he went off to tell the news to his third brother, but he could not speak to him. His brother pressed him to talk and he awoke, sitting up in bed, speaking. When I saw him he was absolutely normal, with no lapse of memory whatever of the events which had preceded the onset of mutism. It had been his first engagement, he said; he had seen for the first time the dead lying about; he became dizzy, thought he fainted, "a chap came along and asked me if I was wounded, but I couldn't tell him, so he took me down, and a major directed me to a cellar and I slept there." He remembered the various hospitals to which he had been sent, and the convalescent camp in which he had spent five or six weeks as a mute. He was sent back by me to his unit.

I have since heard about him from his regimental medical officer, who wrote four months later: "I have since seen Private —— several times at sick parade, complaining of vague and trivial matters, such as pains in the legs, pains in the back, and headaches. ..... At his last appearance on sick parade he complained that his varicocele was giving him considerable discomfort."

His healthy appearance and stubborn manner, his absolute mutism, and inability to cough, the manner of his recovery, the absence of stupor, amnesia, tremor, or any other signs of shock, certain discrepancies between his written and (later) spoken history, his general behaviour while in hospital and after, all throw grave suspicion on the absolute genuineness of the patient's condition. But none of these can be regarded as certain guides. Functional disorders are apt occasionally to simulate malingering, just as at other times they simulate organic lesions. How even the most experienced may be deceived is shown in the following case:—

CASE 22 (Case number 450).—Private, aged 26, with one year's service and three months' service in France, admitted into a base hospital for deaf-mutism of nine weeks' standing. He wrote: "I should be very happy if you can do anything for me. I cannot give a very clear account of what happened, as it is some time since. I remember retiring from Hill —— with some more to some trenches, and in the open we were shelled and I lost touch with our chaps or else they were killed. I remember a great concussion and finding myself on the ground, and a soldier dragged me up and we ran for the trench. I was very thirsty and I ran down the trench to get some water. I met one of our chaps and tried to ask him for some, and I could not make him understand. He only smiled at me. The man who picked me up took me to an officer who was sitting on the edge of the trench and tried to make me understand, and then he sent me with this man to a dressing station, and from there I have been to different places, the names of which I do not know, except the last place, No. —— Convalescent Camp. I have been there about two months ..... ."

He appeared an honest lad, anxious to get well. He wrote that he could hear me, but could not understand what I said. When I whistled he wrote, "I think I can hear a drone." He himself could not whistle, although he "used to whistle

as a youngster." He could not protrude his tongue without first pulling down his lips. He could move it from side to side. He was anæsthetised on the following day, but he did not pass through a stage of excitement, and failed to regain his speech. He was evacuated to England.

Three months later he wrote me the following "confidential" letter from "a convalescent home" in England: "Sir,—I regret very much to have to inform you that I was imposing upon you. ..... I may state that I was physically unfit for the Front. ..... During the whole time of training my pay was chiefly spent in tonics and drugs, but I kept going as I was determined to see what it was like at the Front. ..... I have written this ..... that your 'notes' on cases will not suffer any detrimental effect through my imposture. ..... I have not got my discharge yet, but shall stick out for it. I 'speak' but do not 'hear' very well. ....." He had been for over six weeks in a certain hospital in England, the medical officers of which have had unique experience in the functional nervous disorders arising in this war, but they inform me that they did not regard him as a malingerer. There he repeated to them the same history as he had given me, and spoke of a previous nervous breakdown and recourse to sulphonal and Easton's syrup. His "hearing somewhat improved, but he has always been a little deaf." Before his departure "he could speak, hear a watch, and sometimes hear spoken words." The "convalescent home" (he was careful not to name it) from which he purported to write to me turned out to be another hospital for functional nervous cases to which he was afterwards transferred, the medical officer of which wrote me: "In my opinion this man is not a malingerer. He is very dull and stupid, which perhaps is partly explained by his deafness. His condition appears to me to be one recovering from severe mental shock."

This seems to be an instance of pure malingering.[3] By a pure malingerer I mean one who, although in perfect health, of set purpose initiates a quasi-pathological condition which he will discard when he has gained his end or when he is assured that he is unobserved. So far as concerns disorders of speech, such cases are extremely rare in the present war. With few exceptions the "simulators" of disorders of speech who have come to my notice have been feeble, nervous subjects themselves. Several have come to maintain a disorder which was involuntary and functional in origin, and due, perhaps, to suggestion; they are not pure malingerers.

It is a matter of considerable difficulty for even the most experienced medical officer to decide whether the lack of volitional impulse to overcome the disorder is intentional or is for the time being beyond the individual's control. From the therapeutic standpoint, the difficulty is not of great importance, as long as treatment be confined to such procedures as persuasion, isolation, or anæsthesia; by which means I have "cured" several cases of intentional malingering. From the standpoint of military discipline, however, the difficulty becomes of vital importance; and from this standpoint it is to be remembered that, although long experience yields a highly probable conclusion, absolute certainty can only be reached by detection *in flagrante delicto*.

In theory we may distinguish (*a*) the stage of mutism which is absolutely irresponsive to treatment, and (*b*) the stage in which recovery is possible if only an adequate motor impulse can be aroused to overcome the inhibition. And in (*b*) we may distinguish (i.) the condition in which the patient is constitutionally unable to make the requisite volitional effort; (ii.) the condition in which he refuses to attempt to make that effort; and (iii.) the condition in which he deliberately maintains his mutism by counter-availing volitional effort. But in practice every grade of transition may be met with between (*a*) quite uncontrollable functional disorder and (*b* iii.) sheer purposeful malingering.

At the pathological extreme of the series are to be seen clearly enough cases of true mental shock and, far less commonly, cases due to suggestion, both of which groups evidently belong to that hitherto undifferentiated entity, hysteria. Now, of hysteria no medically qualified man, unless he be steeped in the profoundest ignorance, would assert that it is identical with, or that it necessarily implies, any of the above-mentioned degrees of malingering. The cases of mental shock that recover their speech in a music-hall or at a cinematograph entertainment, or that recover their sight or the movement of their limbs upon receiving another mental shock, clearly need not have been malingerers. It is hardly less obvious that malingering has not necessarily been present in mutes who become cured through suggestion, encouragement, or threats of punishment, or under the excitement of early anæsthesia, by faradisation of the neck or larynx, or by the vomiting brought about by the administration of ipecacuanha.

[3] For various reasons I think it highly improbable that the letter is that of a hysteric weaving a tissue of accusations against himself for the sake of attracting attention and gaining notoriety.

Dysarthria.

The cases of dysarthria with which I have met range from a slight stutter, stammer, or jerkiness of speech to almost complete anarthria, according to the degree of disturbance in the correct working of the articulatory mechanism. These cases are almost invariably associated with other motor incoördination of a functional character, and in consequence will be more conveniently described in a later communication dealing with disorders of the voluntary muscular system generally.

Aphonia.

Cases of primary aphonia from mental shock, "of unconscious origin," as contrasted with functional aphonia due to suggestion, conscious or unconscious, are, in my experience, rare. In this and in other respects aphonia is distinguishable from mutism; they are not to be considered as differing from one another merely in degree. I have seen several cases where the hoarseness originating from a severe cold passed into a functional aphonia which was subsequently allowed to persist. I have cured some of these cases by persuasion, and some by such mild torture as pin-pricking, continued until the patient is induced to give his answers in a loud voice. Usually a feeble "nervous" fellow, he at length speaks aloud, bursting into tears as he realises that his simulation has been detected.

Malingering plays a far more important factor in this variety of speech defect than in any other. I have met with a few cases of pure malingering.

Not infrequently a mute patient begins to whisper when he first recovers his speech. But I have not had a case in which, by further suggestion, I have failed at once to overcome the obstacle to phonation.

General Conclusions.

The views already expressed in this communication, as to what mutism is due and to what it is not due, are also applicable to dysarthria and aphonia.

Such disorders, I repeat, are not immediately attributable to violence, gas poisoning, or other physical causes. They are the result of a functional inhibition, which is usually traceable to intense fear or horror, but which may, I believe, occasionally arise in circumstances where consciousness has been so instantaneously lost that the emotional effects of the shock have not been actually experienced by the patient.

These disorders are not generally to be regarded as the direct outcome of suggestion or association, although, as in the other manifestations of shell shock,[4] previous experience or congenital tendencies may influence the form in which the disorder gains expression. In some instances, no doubt, the speech mechanism is a weak spot in the patient's nervous armour. He may have stuttered when a child, he may have been subject to attacks of hoarseness, he may have passed through an abnormally long period of "infancy," he may never have been as ready of speech as most of his fellows, and so on. But though these may be contributing factors, they are not the prime cause of the disorders of speech in shell shock, save in the exceptional cases previously mentioned.

Nor are they due to some "fixed idea of paralysis" in the cortical structures controlling voluntary speech. Such terminology belongs to an effete psychology; it has been long in vogue among physicians for the explanation of functional disturbances generally. A woman suffering from hysterical palsy of a leg has been often said to be possessed of the "fixed idea" that she cannot move it. If we insist "How do you know that she has this fixed idea if she stoutly denies entertaining it and even evinces a keen desire to recover the use of her limb?" the retort comes, "Ah! the idea of paralysis is subconscious; she does not know that she has it, but it is there."

The word "idea," however, necessarily implies the presence of a personality that consciously experiences and admits it. And to speak of the existence of a fixed idea which cannot be

[4] Cf. in the third of my communications the influence of past history.

proved to be in consciousness under any conditions whatever is a sheer abuse both of psychological language and of scientific method. In the case of the disorders of speech arising from shock, I have never found the slightest evidence that the subject, whether in his normal or in a hypnotic state or in any derived personality, has a "fixed idea" that he is mute or that he is powerless to converse save in a whisper or stuttering.

I have little doubt that this pseudo-psychological explanation proceeds from two sources: (i.) from the notion that functional disturbances are fundamentally due to disordered volition; and (ii.) from the notion that, in order to carry out a willed movement, the idea of that movement must necessarily be present to the subject's mind. Neither of these notions is correct. In the first place, one of the most important lessons to be learnt from the study of shock in this war is that its effects are primarily due to derangement not of the will, but of the conscious and unconscious processes which are the foundation of personality, and that (through mechanisms and causes of which at present we know little) this derangement may indirectly become manifest as functional disorders, e.g. of intelligence, memory, movement, sensation, or reflexes, at various levels of the central nervous system. In the second place, modern psychologists have come to recognise that volitional movements may, and commonly are, performed without the subject having in consciousness an idea, or even a kinæsthetic image, of those movements.

It is, then, not the idea of paralysis of volition that is fixed, but the psycho-pathological process of inhibition. Inhibition, arising primarily from disorder within the personality, is the fundamental cause of the effects of shell shock.

Now in dealing with the disturbances of cutaneous sensibility (in the third of these communications), we saw that the responsible inhibitory processes are of two kinds. On the one hand, we traced *diminished* sensibility to a blocking of the ascending paths which normally enable the subject to become aware of his cutaneous sensations, the block preventing these sensations from entering into and becoming part of his personality. On the other hand, we traced *increased* sensibility to a blocking of the descending paths that control normal sensibility, in the absence of which control cutaneous sensations become more diffuse and the affective and sensori-motor reactions more intense. In the case of the disorders of speech two similar kinds of inhibition are discernible, the one due to a blocking of the paths that subserve the mechanism of articulation or phonation, the block producing the *quasi*-paralysis of functional mutism or aphonia; the other due to a blocking of other paths that control and coördinate those mechanisms, the block producing the quasi-spastic, -clonic, or -ataxic conditions of functional dysarthria.

In some cases of mutism the block yields a condition to some extent comparable to a so-called "kinæsthetic apraxia." The patient appears to lack all notion of how to talk, to whistle, or to cough. Instead, he makes extraordinary grimaces, his mouth often continuing to work long after he is actually endeavouring to imitate a given word. It may be called a state of functional motor aphasia, and it is due, like that of organic motor aphasia, to an inability to translate normally produced internal language into the corresponding movement. In both forms the patient may read and write intelligently, but the functional form may differ from the organic in that in the former speech may be completely absent, whereas in the latter the patient is occasionally able to utter a few words normally articulated.

In other cases of mutism the inhibition is of a higher order, and it results in a state comparable to an "ideational apraxia," in which the subject can perform simple articulatory movements but is powerless to combine them into the movement complexes of speech. Thus, I have seen patients well able to reproduce consonants and vowels, but yet unable to unite them into a syllable or word.

In other cases, again, the inhibition produces a state resembling "verbal agnosia," in which the patient has forgotten the meaning of words heard or read. Such cases have not been included in this communication, as they may be more conveniently considered under the head of amnesia. They differ from those of organic verbal amnesia in that the disturbance does not necessarily relate to all words, and so does not result in a total verbal apraxia.

Lastly, the areas inhibited may spread still wider or higher, producing partial or complete amusia, alexia or agraphia, or narrowing the field of consciousness to a condition of general amnesia in which the patient has lost all memory of the past, or to one of stupor in which he has lost all power of response to his environment.

In every case the inhibition is purely functional, originally dependent on the character of the total psychosis—i.e., the personality of the subject, at any given moment. That personality may be changed again in sleep, under light anæsthesia, during hypnosis, or through strong emotion or desire, or during momentary lapses when, for unknown reasons, the inhibition is, so to speak, "caught off its guard"; and in these conditions the inhibitory process, and hence the disturbances of speech, may disappear, only to return on the revival of the disordered personality. The inhibitions caused by shock are primarily the expression of disordered personality.

Such disturbances of speech, such inhibitions, are not, as has been urged, maintained by fear, nor need they be evoked by fear. They may be evoked by various other emotions, by horror, grief, disappointment, anxiety, or they may be due merely to the obscure neuro-pathological concomitants of shock when no emotion, as such, has had the opportunity of being experienced; and they are maintained by the persistence, not of the emotion as such, but of the pathological disorder of inhibition thus arising.

It may be objected that the inhibition often seems to outlast the return of the normal personality. Yet the claim may be fairly put forward that when a mute patient has recovered from a condition of stupor but is still amnesic in regard to some of the experiences through which he has passed, the restoration of his normal personality is apparent rather than real. If personality be viewed from a wide enough standpoint, no one can claim to have a normal self so long as part of the activities of that self, once functional, are pathologically inhibited.

It must be conceded, then, that, as in most cases of mutism, the changes of personality may be obvious at the outset (involving amnesia, stupor, automatism, &c.), but that later the normal personality may be apparently—but only apparently—restored while the functional disorder in some form persists. In such cases, as we have seen, the disorder is usually of unconscious origin, due directly to the shock, and may occur in men free from suspicion of prior neuropathic taint.

It must also be conceded that, as in a few cases of mutism and as in nearly all cases of aphonia, the change of personality may be imperceptible from the outset. In such cases the disorder is perhaps of conscious origin, due to suggestion or the persistent expression of a powerful emotion (e.g., mutism during fright), and it occurs usually in men of a neurotic constitution.

Into these two classes, I suggest, such cases of shell shock, and of functional or hysterical disorder generally, may be divided. But it must be recognised that neither between these two classes nor between the second class and the class of malingerers is it possible to draw any definite line. Not only do they merge into one another, but occasionally a case may belong to more than one of these classes.

THE annual distribution of prizes will take place in the Out-patients' Hall of Charing Cross Hospital on Monday, Oct. 2nd, at 3.30 P.M. Dr. J. Mitchell Bruce, consulting physician to the hospital, will give away the prizes. A reception will afterwards be held at the school, when the laboratories, museum, and library will be open to inspection.

DEATH OF DR. E. B. GRAY.—Edward Benjamin Gray, whose death occurred recently at Oxford, was one of the oldest medical practitioners of the city and consulting physician to the Radcliffe Infirmary. He was in his eighty-fifth year and had been associated with the medical life of the city since his early days, when he was appointed house physician at the Radcliffe Infirmary and County Hospital on leaving St. Bartholomew's Hospital. He graduated at Exeter College in 1852, became M.R.C.S. in 1856, and took the degree of Doctor of Medicine in 1861. He was also for some time Litchfield lecturer in clinical medicine, and examiner in medicine. He had a wide practice and was exceedingly well known and highly respected. He had not practised since 1902, when he had a severe illness.

THE EFFECT OF TRENCH WARFARE ON RENAL FUNCTION.

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To those who are chiefly interested in the medical history of the present war an outstanding and rather unexpected feature has been the frequency of acute nephritis. This has for long been under observation in the British Expeditionary Force, it has appeared later amongst the French armies, and it seems to have attracted a good deal of attention in the German and Austrian armies at some periods of the Eastern campaign. Further, in his memorandum on the subject, Colonel Beveridge draws attention to the important part which it played in the Civil War in America.

All this seems to point to one of two things—either an infectious agent which is afforded peculiar opportunities owing to the intermingling of large bodies of men and so is able to attack a large number of susceptible individuals who in their everyday life had no contact with such infection, or some conditions associated with warfare which put an excessive strain upon the kidney. Possibly there is a combination of both factors at play.

The work recorded by Colonel Beveridge and also that described in the papers of Langdon Brown[1] and Mackenzie Wallis[2] go to show that a toxic action such as would be caused by chemical impurities in food or drink can be excluded. There remain therefore three possible explanations, which are:—(i.) The theory of infection; and to this explanation Langdon Brown and Mackenzie Wallis seem most inclined, assuming the existence of some ultra-microscopic virus since they are unable to demonstrate any recognised bacterial type. (ii.) That the nephritis is due to weakening of the kidney under the prolonged strain of frequent severe exposures and an unusual diet. (iii.) That the kidney weakened by some such causes as are mentioned under (ii.) becomes liable to severe inflammation as soon as it is exposed to circulating bacterial toxin, absorbed from a focus of infection in some other part of the body, e.g., bronchitis.

If the etiology of the nephritis at present so common comes under either (ii.) or (iii.), it might reasonably be expected that a considerable proportion of the men who continue "on duty" would show some evidence of deficient or abnormal renal function, and that it would be amongst these men showing evidence of latent kidney lesions that the cases of nephritis recorded subsequently would occur. It was therefore with a view to answering the question whether the causes described under (ii.) and (iii.) could be excluded that our investigation was planned.

The greater part of our work deals with the incidence of albuminuria amongst "healthy" troops, its persistence in the cases in which it does occur, and the character of the urinary sediments which are associated with it. Unfortunately neither of us has had an opportunity of thoroughly overhauling the existing literature with regard to the incidence of albuminuria amongst the healthy civil population of France or Britain; but we can safely state that no extensive data on this subject have been published for French or British troops during this war.

Now assuming that we are dealing with a nephritis of gradual onset and that albuminuria is an indication of weakening of the kidney, we would expect to find symptomless albuminuria most frequent where nephritis is most frequent. One would therefore expect to find most albuminuria amongst troops who were in the trenches or had recently left them; and again more amongst the British troops than amongst the French. For we believe that we are justified in concluding that nephritis has been much less common in the French armies, since it was not till the autumn of 1915 that its occurrence was frequent enough to attract any special attention. Unfortunately no precise figures are available. The results of investigation were as follows.

[1] Journal of the Royal Army Medical Corps, vol. xxv., p. 75; THE LANCET, Feb. 19th, 1916, p. 391.
[2] Journal of the Royal Army Medical Corps, vol. xxvi., p. 259.

Class I.—French troops, territorial infantry, examined within the first 24 hours after their return from the trenches.

Examined.	With albuminuria	Copious.	Distinct.	Trace.
1861 men		4	16	10

that is, 1·66 % had albuminuria.

Class I.A.—French troops, auxiliary services.

Examined, 231 men, with albuminuria 2; that is, less than 1 per cent. had albuminuria.

Class II.—British troops examined at a divisional bath; most of the units in the division were represented. The great majority of the men had been recently in the trenches (1–8 days previously). About equal numbers of troops who had been for 16 months and of others who had been for six months in France were examined.

Examined.	With albuminuria	Copious.	Distinct.	Trace.
2220 men		27	48	30

that is, 4·73 per cent. had albuminuria.

Thirteen cases in which slight albuminuria was associated with pus or spermatic discharge, as determined by examination of the sediment of the centrifugalised urine, are not shown in this total, and such cases are also excluded in the following classes.

Casts of various kinds, but usually scanty hyaline casts, were found in the urines of 30 men, i.e., 1·35 per cent.; whereas red blood corpuscles, which were rarely numerous, were detected in the sediments of 14, or 0·62 per cent., of the urines.

Class III.—British troops who had been for some days in the trenches during the coldest weather of the year and from whom the specimens of urine were collected in the trenches. These men all belonged to one unit, a Territorial regiment, which had been in France for 12 months.

Examined.	With albuminuria	Copious.	Distinct.	Trace.
311 men		Nil	4	7

that is, 3·53 per cent. had albuminuria.

The sediment was only examined from six of these, and in one a few hyaline casts were detected.

Class IV.—British troops, the personnel of various medical units, who were living mostly in billets under conditions similar to those of barrack life at home.

Examined.	With albuminuria	Copious.	Distinct.	Trace.
2096 men		9	25	26

that is, 2·91 per cent. had albuminuria.

Casts were detected in 18, or 0·86 per cent., and red blood corpuscles in 14, or 0·66 per cent.

Class V.—British troops recently recruited from all parts of the British Isles and in hard training; these had not been to France. Specimens were taken at 8.30 A.M. before the men had been on parade.

Examined.	With albuminuria	Copious.	Distinct.	Trace.
553 men		8	28	20

that is, 10·12 per cent. had albuminuria.

No examination was made for casts; but 4, or 0·71 per cent., had blood in their urines.

Before attempting to interpret these results it will be better to present such observations as have been made with regard to the persistence of those albuminurias, and the state of health, actual and past, of the men whose urines did contain albumin. For Class I., the French troops, these observations are given in Table I.

A systematic examination of the subsequent history of the case was not made for all men found with albuminuria amongst the British troops; the following facts were ascertained, however.

Class III.—Six of the 11 cases in this group were re-examined a week later, and 4 were found to be negative.

Class II.—Of the 105 men in this group, 35 were re-examined after five months, and of these 13 again presented albuminuria. One of these had copious albumin, with many and varied casts, besides a good deal of epithelial débris in his urine on both occasions, but had continued on duty with his battalion throughout.

In the case of another three observations were made. On the first occasion albumin was copious; on the second, two weeks later, it was a trace only; and on the third, four months later, it was distinct. No casts, blood, or leucocytes were detected on any of these occasions.

Only 1 out of the 105 had been invalided for nephritis in the five months since the original observations were made: he had copious albumin, some blood, and a few casts in his urine when examined, and he was evacuated for nephritis six days later.

Class IV.—Full observations of the subsequent progress of cases of albuminuria in this group were made and are recorded in Table II. It will be noted that two of these men developed nephritis subsequently.

Subsequent Occurrence of Nephritis in Men Free from Albuminuria.

Class II.—One man in this group developed nephritis 2½ weeks after a negative observation.

Class IV.—There were two cases in this group. One of these fell ill six weeks after the negative observation and the other ten days after it. The second man died, his nephritis being complicated by a general streptococcal infection.[3]

Discussion.

These results are disappointing, inasmuch as they do not afford convincing evidence of a positive kind that part of the cases of nephritis observed have an acute onset and are therefore probably due to an infection which suddenly attacks a healthy kidney. Such a result, however, could scarcely be expected, since the number of men of whose examination a record was kept, 4300, was scarcely large enough, and unfortunately the incidence of nephritis amongst the 2200 divisional troops examined was low in proportion to the number of cases recorded in the rest of the division during the five months after the observation.

The number of men who developed nephritis subsequently to a negative observation for albumin, three, was exactly the same as that of those who developed nephritis after a positive observation. But the records of Cases 23 and 25, Table I, show that a manifestation of renal abnormality by intermittent albuminuria has to be kept in view, although it is possible that albuminuria was constant in these men as long as they were going about in ordinary conditions of exposure, diet, and exercise. Moreover, the record of Case 46, Table II., appears to indicate that a kidney which there was good reason to suppose in a condition of chronic nephritis, could keep back albumin on one day and let it pass on another. All this goes to show that in the three cases recorded the absence of albuminuria at one examination only made it probable, not certain, that the nephritis which developed shortly afterwards was due to a sudden change in a healthy kidney.

Turning, however, to the other aspect of these results let us analyse them to determine what evidence they contain that a condition of undue fragility or defective function arises in the kidneys owing to the conditions of trench warfare.

The two outstanding features of the figures and tables recorded elsewhere are: first, the decidedly lower incidence of albuminuria amongst the French troops; and, secondly, its extraordinarily high incidence amongst troops in training in England. The first was expected in view of the smaller number of cases of nephritis amongst the French; the second was quite unexpected. This last result, however, which is at first so perplexing, appears on reflection to be one in the light of which part of the other results can be most correctly interpreted. It makes it very probable that there is a high percentage of albuminuria amongst all young soldiers in heavy training. Now since nephritis is not unduly frequent amongst the troops in training in England at present, nor amongst recruits at any time, it is obvious that there is very little connexion between the excessive frequency of albuminuria amongst these men and the development of nephritis. This albuminuria can probably be correctly classed with that type which has been called "fatigue" albuminuria, and probably depends on the partial asphyxia of the kidney tissue, which exists whenever there is a temporary lack of accommodation on the part of the cardio-pulmonary system to an unusual physical strain—i.e., breathlessness.

Now, taking this factor of "fatigue" albuminuria into consideration, and looking at the figures for the troops in France, we find that it is a partial explanation of such variations of the incidence of albuminuria as were found between one class of troops and another. The lowest figures were obtained for the personnel of various medical units; but these are troops amongst whom a large proportion are engaged on work which does not entail heavy physical exertion—e.g., clerks, cooks, nursing orderlies, &c.—and when you take the figures for infantry you find that the lowest figures are for those who are actually in the trenches and subject to the greatest exposure, whereas those who are "resting"—i.e., sleeping sheltered in billets, but having a great deal of exercise, fatigues and marching—show the highest percentage of albuminuria.

When every allowance has been made, however, for phenomena of the type of "fatigue" albuminuria there

[3] Captain Clarke, R.A.M.C., has published an account of this case in the Brit. Med. Jour., 1916.

TABLE I.—OBSERVATIONS ON CASES OF ALBUMINURIA IN FRENCH TROOPS, CLASS I.

No.	Age	Albumin.	Sediment.	Persistence of albuminuria.	Previous health.	Symptoms.	Possible or probable explanation.
1	37	C.	?	Persistent.	Enteric at 18 years.	Bronchitis.	? Chronic infective nephritis.
2	41	D.	?	48 hours.	Good.	Nil.	"Fatigue" albuminuria.
3	40	C.	?	12 days.	Persistent hoarseness which came on after ty. inoculation.	,,	?
4	37	C.	—	8 days: recurrence 16 days later for 48 hours.	Inflammation of throat 15 years before; two injections of serum were made.	,,	?
5	40	D.	—	15 days.	Pleurisy 6 years before exam.	—	?
6	39	D.	—	15 ,,	Nil.	Nil.	?
7	40	D.	No casts.	15 days: recurring twice for short periods.	,,	High blood pressure.	Chronic nephritis.
8	36	D.	—	21 days: recurring twice for short periods.	Scarlet fever at age of 5.	Nil.	? Chronic nephritis.
9	22	T.	—	24 hours.	General debility.	—	?
10	24	T.	—	24 ,,	Subject to diarrhœa.	—	?
11	38	T.	—	24 ,,	Cardiac symptoms but no signs.	—	?
12	32	D.	—	48 ,,	Enteric 1915; eyes easily tired.	Slight fever.	?
13	35	T.	—	24 ,,	Scarlet fever with slight albuminuria at 3 years.	Shell shock of long duration.	?
14	35	T.	—	24 ,,	Wounded Dec. 14.	Nil.	"Fatigue" albuminuria.
15	21	D.	—	48 ,,	—	Laryngitis.	Febrile albuminuria.
16	32	T.	—	24 ,,	—	"Cold in head" and lumbar pain.	,, ,,
17	23	D.	No casts.	15 days.	Wounds received in 1914 broke down a year later and suppurated.	Nil.	?
18	34	D.	,,	Persistent as trace.	Nil.	,,	?
19	30	C.	Red blood cells; leucocytes scanty; hyaline casts.	Persistent.	General debility.	—	Chronic nephritis.
20	30	D.	—	3 days.	Pneumonia.	Slight exophthalmic goitre.	?
21	30	T.	—	24 hours.	Nil.	Nil.	"Fatigue" albuminuria.
22	26	D.	—	48 ,,	Bronchitis, 1915.	? Slight general œdema.	?
23	31	T.	—	24 ,,	Placed in reserve on account of albuminuria.	Nil.	?
24	24	D.	—	4 days.	Chronic bronchitis.	—	Congestion of kidneys.
25	31	D.	—	3 ,,	Rheumatic fever: placed in reserve on account of albuminuria.	Nil.	?
26	31	D.	—	48 hours.	Nil.	,,	"Fatigue" albuminuria.
27	34	D.	—	6 days.	General debility.	—	?
28	34	T.	—	24 hours.	Nil.	Nil.	"Fatigue" albuminuria.
29	21	D.	—	48 ,,	,,	,,	,, ,,
30	25	T.	—	48 ,,	,,	,,	,, ,,

TABLE II.—OBSERVATIONS ON CASES OF ALBUMINURIA IN BRITISH TROOPS, CLASS IV.

Series No.	Albumin. 1st exam.	Albumin. 2nd exam.	Albumin. 3rd exam.	Casts.	Blood.	E.D.	Pus.	Spermatozoa.	Chemical sediment.	Symptoms and previous health.	Probable or possible causes of albuminuria.
1	D.	D.	D.T.	++ Mostly hyaline.	—	Scanty.	—	—	—	Occasional slight headaches.	? Latent nephritis.
2	D.	D.	D.	+	—	,,	—	—	—	Frequent headaches after 1st exam.	,, ,,
3	T.	Nil.	—	—	—	Very scanty.	—	—	—	Short-winded and headaches; influenza two months before.	?
4	D.	,,	—	—	—	,,	—	—	—	Fit.	Fatigue albuminuria.
5	D.	,,	—	—	—	,,	—	—	—	,,	,, ,,
6	D.	D.	Invalided home.	++	—	,,	—	—	—	Enteric, 1902; short-winded; habitual constipation.	? Chronic nephritis.
7	D.	D.	Nil.	++	+	,,	—	—	—	Some œdema of face for a time; occasional urticarial attacks while in France.	? Urticaria.
8	T.	Nil.	—	—	—	—	—	—	—	Quite fit.	Fatigue albuminuria.
9	D.	T.	T.	+ (1st exam)	—	Scanty.	—	—	—	,,	?
10	T.	Nil.	—	—	—	—	—	+	—	—	Spermatic discharge.
11	C.	,,	Nil.	++ (1st exam)	—	+ (Degenerate.)	—	—	—	In hospital for severe lumbar pain subsequently to 2nd obs.; albuminuria recurred and cleared up; otherwise quite fit.	? Renal calculus.
12	T.	,,	—	—	—	—	—	—	—	Diphtheria 8 years ago; also scarlet fever.	? Fatigue albuminuria.
13	D.	Not made.	Not made.	—	—	—	++	—	—	Gonorrhœal discharge.	Gonorrhœa.
14	D.	,,	,,	—	+	?	?	—	—	No record; sent home on munition work.	?
15	T.	T.	Nil.	++ Hyaline.	+	—	—	—	—	Bronchitis recently.	? Congestion of kidney.
16	D.	D.	T.	+	—	—	—	—	—	Pain in back; evacuated for defective vision	? Latent nephritis.
17	T.	T.	Nil.	—	—	Scanty.	—	—	—	Fit.	Fatigue albuminuria.
18	D.	Nil.	—	+ Hyaline	—	—	—	—	—	No history.	?
19	T.	,,	—	—	—	Scanty.	—	—	—	,,	Fatigue albuminuria.
20	C.	C.	C.	++	+	+	—	—	—	Transferred from F.A. to C.C.S. on account of bronchitis and asthma; subsequently invalided.	Chronic nephritis.
21	T.	Nil.	—	—	—	—	—	—	—	No history.	Fatigue albuminuria.
22	D.	,,	—	—	—	Scanty.	—	—	—	,,	,, ,,
23	T.	,,	—	—	—	—	—	—	—	,,	,, ,,
24	T.	,,	—	—	—	Sq. D.	—	—	—	,,	,, ,,
25	T.	,,	—	—	+	—	—	—	—	,,	?
26	D.	Not made.	Nil	—	—	—	—	+	—	Fit.	Spermatic discharge.
27	D.	Nil	—	—	—	—	—	—	—	Fit; venereal Nov. 15.	?
28	D.	,,	—	—	—	—	—	—	—	Fit.	Fatigue albuminuria.
29	D.	D.T.	Not made; invalided.	—	Scanty.	—	—	—	Urates.	Developed symptoms of nephritis.	Latent nephritis.
30	D.	Nil.	—	—	—	—	+	—	—	Gonorrhœal discharge.	Gonorrhœa.
31	T.	,,	—	—	—	—	—	—	—	Fit.	Fatigue albuminuria.
32	C.	C.	T.	++ (A few blood casts).	++	++	—	—	—	Occasional lumbar pains.	? Latent nephritis.
33	D.	T.	Nil.	?	—	+	—	—	—	Fit.	?
34	T.	Nil.	—	—	—	—	—	—	Oxalates.	,,	Fatigue albuminuria.
35	D.	,,	—	—	—	—	—	—	,,	,,	,, ,,
36	T.	,,	—	—	—	—	—	—	,,	,,	,, ,,
37	T.	T.	T.	—	—	—	—	—	,,	Occasional headaches and swelling under eyes.	? Latent nephritis.
38	T.	Nil.	—	—	—	—	—	—	,,	Fit.	Fatigue albuminuria.
39	D.	,,	—	—	—	—	—	—	—	—	,, ,,
40	T.	D.	Nil.	++	++	++	—	—	—	Chronic cough, otherwise fit.	? Congestion of kidney.
41	T.	T.	T.	—	—	—	—	—	—	Fit.	?
42	D.	D.	Not made.	++ A few cellular.	+	+	—	—	—	Gave up football 2 years ago for shortness of wind, otherwise fit. Developed nephritis with uræmia 16 days after 2nd examination.	Latent nephritis.
43	C.	D.	C.	++ Hyaline & cellular (1st & 2nd exams.).	—	+	—	—	Fine oxalates 3rd exam.	Attack of influenza 12 days before 1st observation.	? Latent nephritis.
44	T.	T.	Nil.	—	Scanty	Scanty.	—	—	—	Slight attack of diphtheria at 17. Feverish co'd at time of 1st observation.	? Febrile albuminuria.
45	F.T.	—	,,	—	—	—	—	—	—	Fit for duty.	Fatigue albuminuria.
46	T.	Nil.	—	—	—	—	—	—	Urates.	In hospital for nephritis 5 years previously.	Chronic nephritis.
47	D.	,,	—	—	—	—	—	—	—	Feverish cold 1st observation.	Febrile albuminuria.
48	C.	D.	C.	—	—	+	+ 1st and 2nd exams.	—	Crystalline.	Fit.	Infection of urinary tract.
49	D.	Nil.	—	—	—	—	—	—	—	Herpes and "cold." Otherwise fit.	Febrile albuminuria.
50	D.	D.	D.	—	—	—	—	—	Fine oxalates 3rd obs.	Fit.	?
51	F.T.	Not made.	Not made.	—	—	—	—	—	—	,,	?
52	D.	T.	D.	+ Hyaline 2nd obs.	+ 3rd obs.	—	—	+ 2nd obs.	—	,,	Latent nephritis.
53	C.	C.	C.	++ Various 3rd obs.	++	+	Scanty.	—	—	Short-winded since infancy on account of bronchitis.	? Chronic nephritis.
54	T.	Not made.	D.	++	Scanty.	—	—	++	Oxalates 1st obs.	For 6 years has had occasional attacks of pain in back and œdema, but is usually fit.	,, ,,
55	D.	Nil.	—	—	—	—	—	—	—	In previous year was once 5 days in bed with abdominal pain.	?
56	C.	?	Nil.	—	—	—	—	—	Fine oxalates	Fit.	?

TABLE II.—OBSERVATIONS ON CASES OF ALBUMINURIA IN BRITISH TROOPS, CLASS IV.—(*Continued.*)

Series No.	Albumin. 1st exam.	Albumin. 2nd exam.	Albumin. 3rd exam.	Casts.	Blood.	E.D.	Pus.	Spermatozoa.	Chemical sediment.	Symptoms and previous health.	Probable or possible causes of albuminuria.
57	C.	Mistake regarding name.		+ Hyaline.	—	—	—	—	Fine oxalates	—	?
58	T.	Nil.	—	—	—	—	—	—	Urates.	Fit.	Fatigue albuminuria.
59	D.	D.	D.T.	—	—	Sq. D.	+	+	—	Occasional œdema and pain across back.	Chronic infective nephritis.
60	? D.	Nil.	—	—	—	,,	—	—	Urates.	Invalided for bronchitis, dilated heart, and œdema 2 months before. Since returned to unit.	? Cardiac.
61	? T.	Not made.	Not made.	—	—	—	++	—	—	—	Gonorrhœa.
62	C.	,,	Copious	++ 2nd obs.	++	+	+	+ 1st obs.	—	Has suffered from skin eruptions. ? Herpes zoster.	?
63	F.T.	Nil.	—	—	—	—	—	—	—	Slight feverish cold at time of 1st observation.	Febrile albuminuria.
64	T.	,,	—	—	—	—	—	—	—	Gonorrhœa Dec., 1914. Venereal sore 1916.	?
65	D.	D.	Nil.	—	+ 1st obs.	—	—	—	—	Rheumatic fever 10 years before; pain in back ever since, occasionally.	? Chronic nephritis.

C. = Copious albuminuria. D. = Distinct ditto. D.T. = Distinct trace ditto. T. = Trace ditto. F.T. = Faint trace ditto. + = Present in small amount. ++ = Present in considerable amount. Sq.D. = Squamous débris. E.D. = Epithelial débris.
Second examination was made 3 to 10 days after first; third 4 to 8 weeks after first.

remains unexplained the fact that amongst British troops in the most favourable conditions there are two cases of albuminuria for every one amongst the French troops, even under conditions of trench life.

The data already recorded show that a portion at all events of the cases of nephritis come from those men exhibiting albuminuria, but that a very great majority of these albuminurias are either transitory or compatible with fairly good health; in two cases at all events the man continued doing their full duties for five months, although their urines contained copious albumin, with abundant and varied casts, on every occasion that they were examined. The results of this part of the investigation can be summarised as follows:—

(i.) That the frequent and prolonged exposures associated with trench warfare do not appear to produce degeneration or inflammation of the kidney independently of other causes.

(ii.) That the much greater incidence of symptomless albuminuria amongst British than amongst French troops requires explanation. In view of the considerable similarity of the two stocks, the explanation that it is due to racial peculiarities does not recommend itself. Further, on account of its transitory nature in the great majority of the cases it is not likely to have an infectious origin, and we are forced back on the only remaining explanation that occurs to us—that is, that it might be due to the diet of the British troops.

(iii.) That the exacerbation of these symptomless or latent albuminurias has only been shown to account for a portion of the cases of acute nephritis which occur.

(iv.) That the presence of red blood corpuscles in the urinary sediment has a more serious significance than the presence either of considerable amounts of albumin or of casts. In the three larger groups of British troops examined the number of men with hæmaturia was in every case from 0·6 to 0·7 per cent., although the proportion with albumin or casts varied considerably. All three men with albuminuria who subsequently developed nephritis had blood in their urines, also two men with albumin who were subsequently invalided on account of general debility and cardiac weakness, and who were probably cases of chronic nephritis, showed hæmaturia. Of course the group of men with hæmaturia will also include men with abnormalities in the renal tract such as calculus and polypus, or with circulatory anomalies similar to urticaria.

Examination for Evidences of Abnormal Renal Function other than Albuminuria.

Two other lines of investigation have been pursued; an examination for abnormalities in blood pressure and estimations of the excretory work of the kidneys.

Blood pressure.—Observations on 40 French soldiers gave an average maximum pressure of 15·5 cm. and an average minimum pressure of 9·5 cm. The highest maximum pressure recorded was 18 cm. and the lowest 13·25 cm. The highest minimum was 11·5 cm. and the lowest 8 cm.

Observations on 14 British soldiers. These were men who turned up with minor ailments at a regimental "sick parade" during the coldest weather of the year. Most of them had left the trenches about six hours before. The average maximum pressure was 14·75 cm. and the average minimum pressure was 8 cm. The highest maximum was 17·5 cm. and the lowest 12 cm. The highest minimum was 10 cm. and the lowest 5 cm.

The pressures recorded amongst the British troops were therefore on the whole lower than amongst the French, and the observation does not give any evidence of latent kidney defect for either group.

Daily excretion of urine, urea, and salt.—These results are given in detail in Tables III. and IV. The outstanding feature of these tables is the marked excess of urea excreted by the British troops. The average total of urea excreted is three times as high for British troops as for French. Since both sets of men were living under similar conditions, were in good health, and were having very little physical exercise, it can be concluded safely enough that the high output of urea on the part of the British was due to an excess of protein in their diet. This conclusion is strengthened by the observations on the British controls, who were leading a very active life without any excessive physical exertion and eating army rations with the addition of some fresh vegetables obtained locally. All three were men above the average height and weight, yet their excretion of urea was little more than half of the average figure for men in the trenches.

General Summary.

From the results recorded in this paper we are inclined to draw the following conclusions:—

(i.) That exposure alone has probably got nothing to do with the causation of a number of the cases of nephritis

TABLE III.—*French Troops.*
Infantry in Trenches.

No.	Total urine in 24 hours.	Urea per 1000 c.c.	Total urea.	NaCl per 1000 c.c.	Total NaCl.
	c.c.	grammes.	grammes.	grammes.	grammes.
1	1200	10·50	12·60	5·55	6·66
2	1500	16·0	24·0	8·77	13·16
3	750	33·50	25·12	2·34	1·75
4	1500	12·0	18·0	8·77	13·15
5	1000	11·0	11·0	9·06	9·06
6	1000	4·0	4·0	8·54	8·54
7	1200	4·50	5·40	10·60	12·72
8	1000	5·0	5·0	8·24	8·24
9	1200	4·0	4·8	9·6	11·52
10	1500	23·0	34·50	6·2	9·3
Average for troops	1185	12·35	14·442	7·767	9·41
Staff of Hospital.					
1	1750	10·0	17·5	1·491	2·6
2	2000	15·5	31·0	10·64	21·28
3	1800	21·5	38·7	11·99	21·58
Average for controls	1850	15·66	29·066	8·04	15·153

TABLE IV.—*British Troops.*

Infantry in Trenches.

No.	Total urine in 24 hours.	Urea per 1000 c.c.	Total urea.	NaCl per 1000 c.c.	Total NaCl.
	c.c.	grammes.	grammes.	grammes.	grammes.
1	2000	22·3	44·6	9·8	19·6
2	2000	22·138	44·277	5·0	10·0
3	2250	25·055	56·361	5·8	13·05
4	1750	32·04	56·075	8·0	14·0
5	1750	18·35	32·115	8·0	14·0
6	1750	26·216	45·879	6·4	11·2
7	2250	30·28	68·15	4·4	9·9
8	2000	26·304	52·608	1·28	2·56
9	2250	12·816	28·838	5·2	11·7
10	1500	27·38	41·07	5·2	7·8
11	1750	26·216	45·879	8·2	14·35
12	2000	36·703	73·407	6·8	13·6
13	1500	32·042	48·064	8·8	13·2
14	1500	14·524	21·788	6·6	9·9
15	1250	13·103	16·379	9·0	11·25
Average for infantry	1800	24·40	45·03	6·6	11·74
Laboratory Staff.					
1	2500	10·486	26·217	5·0	12·5
2	1100	23·886	26·275	8·0	8·8
3	3300	8·739	28·838	2·6	8·58
Average for controls	2300	14·37	27·11	5·2	9·96

observed in France, especially the milder ones; and that if it has a part in the etiology of the more severe cases it will be similar to that exhibited in many infectious diseases—namely, that of setting up a defective circulation in an organ so as to render it less capable of resisting bacterial invasion.

(ii.) That transitory albuminuria is very common amongst all troops, especially those making considerable physical efforts, and that the majority of these albuminurias can be classed with the so-called "fatigue" albuminuria.

(iii.) That there exist, especially amongst the British troops, an excess of cases of symptomless albuminuria apart from those just mentioned, which cannot all be classified as chronic nephritis and which probably correspond to the surprisingly mild type of nephritis which has been so often observed during this campaign amongst the British troops.

(iv.) That diet appears to be the most likely explanation of this excess of transitory albuminuria and mild nephritis and may also contribute towards the development of the more severe cases. In support of this last conclusion it may be pointed out: that our experiments have demonstrated that the average soldier is consuming an amount of protein food in excess of his requirements, and is therefore throwing an undue strain on his excretory organs; that the relative rarity of acute nephritis amongst younger officers is generally admitted; and that the unusually numerous cases of gingivitis which come under observation probably indicate that the men are suffering to some extent from the restriction of fresh vegetable food, which is usual, and to some extent inevitable, for troops in the front line and not uncommon farther back.

An objection which is likely to be raised to this conclusion is the rarity of nephritis in the South African war, where the diet was similar; but we must remember that the protein content of the diet was actually lower, that on the average the troops had more physical exertion, and that cutaneous excretion, which is at its best in a dry atmosphere, would afford the kidneys considerable relief.

Stated, therefore, briefly, our general conclusion is that the most probable explanation of the nephritis so common in warfare and peculiarly frequent in the British armies, is that in a certain proportion of the men the kidney, in common with the other organs in the body, has its resistance lowered by a slightly scorbutic condition, and gives out when, in addition to this, it is required to make an excessive metabolic effort, owing to high protein diet, or is exposed to bacterial intoxication either by direct invasion or by the establishment of an infective focus in some other part of the body.

We have much pleasure in expressing our thanks to those who have made these investigations possible for us or encouraged us in carrying them on—namely, les Médecins Principaux Dommartin and Le Ray, le Médecin-Major Uffert, les Médecins-aide-Major Chavaillon and Gay; also Surgeon-General Treherne and Surgeon-General Urwin, Colonel Sir W. Leishman, Colonel Sir W. P. Herringham, Colonel O'Callaghan, Colonel Fell, Colonel Peterkin, Captain Walsh, and the numerous officers in command of medical units, from the personnel of which samples of urine were obtained. We are also much indebted for their very willing assistance to Messrs. Fauquex, Laboure, Fresco, and J. C. McLeod, M.A., R. E. Bevan-Brown, B.A., Bull, Bartlett, and Jackson.

THE DIAGNOSTIC VALUE OF TUBERCLE OF THE CHOROID.[1]

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IT appears to me that in modern times there is some little tendency to overlook the general diagnostic value of tubercle of the choroid. As regards affections of the meninges, the importance now attached to a naked-eye, chemical, microscopic, and bacteriological examination of the cerebro-spinal fluid is doubtless partly responsible for this neglect. How simple is the diagnosis, say, of a tuberculous meningitis rendered when, in association with meningeal symptoms, the cerebro-spinal fluid is found to have lost its normal limpidity, to contain lymphocytes, and to include tubercle bacilli. At the same time it is well to remember that the discovery of tubercle of the choroid may enable us to diagnose not only diseases of the central nervous system but the tuberculous nature of lesions of other parts of the body. In one condition, indeed, acute tuberculosis, it is the sole pathognomonic sign.

The three following cases fell under my notice, within a few short months, in the Queen's Hospital for Children, London. I present them merely in abstract.

CASE 1. *Case admitted as one of apical pneumonia, but recognised as general miliary tuberculosis by the finding of tubercles in the choroid; necropsy; tuberculous nature of the choroidal lesion confirmed microscopically.*—The patient, a boy aged 7 months, was admitted on Nov. 13th and died on Nov. 15th, 1912. There had been a slight cough for two weeks. The child had been ill for four days. This illness began with vomiting immediately after food. No previous illness. Baby bottle-fed from birth. Parents healthy. No other children. On admission: A well-nourished infant. Temperature 100° F.; pulse 120; respirations 36. Looks meningeal. Head slightly retracted and limbs rather rigid. The percussion note is impaired over the apex of the left lung, although the impairment does not amount to actual dullness. The affected area shows broncho-vesicular breathing, together with fine and medium crepitations. A diagnosis of apical pneumonia made.

On the following day (Nov. 14th) there was conjugate deviation of the eyes to the left. The left fundus oculi showed large circular tubercles of the choroid in the central region. Death occurred at 9 A.M. on the 15th, being preceded by a temperature of 104°.

The general post-mortem examination showed large caseous areas in the left upper lobe of the lung, the remainder of which was in an acute pneumonic condition. The other lung, the spleen, the peritoneum, and the meninges were studded with miliary tubercles. The choroidal lesions showed the ordinary structure of choroidal tubercle—namely, lymphoid cells, endothelioid cells, and giant cells. Tubercle bacilli were also present. Areas of caseation were not uncommon.

CASE 2. *Child, aged 6 years, admitted for (?) appendicitis; exploratory abdominal incision revealed tuberculous peritonitis; finding of tubercle of choroid led to diagnosis of acute tuberculosis; death.*—The patient, a girl aged 6 years, was admitted on Oct. 30th, 1912. The child had been ailing on and off for several months. The bowels had been costive, and there had been pain in the abdomen. For the last two days the pain had been worse, and there had been retching and sickness. The family history was as follows: One other child alive and well. One died at 4 months from "wasting." One died, premature birth. Father suffers from diseased leg, present since he was three years of age. Mother has not been well since marriage. Mother's brother died from

[1] A paper read at the Oxford Ophthalmological Congress on July 14th.

consumption, and a sister is now very ill with the same disease. Paternal grandfather died from phthisis pulmonalis. On admission the temperature was 102° F., pulse 156, and respirations 36. Pain in abdomen, aggravated by deep palpation. Abdomen, which moved well with respiration, was slightly distended. No rigidity; doughy feeling. Some dullness at base of right lung and in a three-inch patch at angle of right scapula, over which fine crepitations and moist râles could be heard. Two hours after admission, under the impression that the case might be one of pneumococcal peritonitis, the abdomen was opened by a small incision over the margin of the rectus muscle. The peritoneum was found to be studded with small miliary tubercles. The wound was closed in three layers (peritoneal, fascial, and cutaneous). The course and progress of the case was as follows: Nov. 3rd: Tubercles in both choroids. On the same date tubercle bacilli found in urine. 5th: Sketch made of left fundus, which shows no fewer than eight tubercles, all situated in the central region of the fundus, and varying in size from 1/10 to 1/4 the diameter of the optic disc. (Fig. 1.) 7th: Multiple tubercle of both choroids. 12th: Slight optic neuritis. Retinal veins full. Tubercle in all stages in the fundi. Dec. 6th: Child getting thinner. Slight but numerous physical signs in the lungs. Spleen palpable. Abdomen soft. Examination with

FIG. 1.

Case 2: Tubercles of choroid in left fundus oculi.

X rays showed poor movements of the diaphragm, especially on the right side. Both lungs "fuzzy," due to miliary tubercle. The child died at 5.25 A.M. on Dec. 20th, 1912.

CASE 3. *Child, aged 3 years, admitted as a case of lobar pneumonia; diagnosis of typhoid fever thought more likely in hospital; the discovery of tubercle of the choroid, however, led eventually to the diagnosis of acute tuberculosis, from which the patient succumbed; necropsy; examination of the choroidal tubercles.*—A girl, aged 3 years, was admitted on Oct. 12th, 1912, as a case of lobar pneumonia. Ill two weeks. Onset gradual; began with headache and diarrhœa. Anorexia. Bowels open two or three times daily; irregular now. Occasionally wanders at night. No history of epistaxis. No previous illness. Family history good. On admission the face was pale and the child was restless. Respiration very hurried. No cyanosis. Pulse 160; temperature 103·6° F. Heart sounds normal. As regards the lungs, there seemed to be impairment at left apex anteriorly and at right base anteriorly. Breath sounds weak. Rhonchi everywhere present. The progress and course of the case was as follows. Oct. 27th: Aspect typically pneumonal. Respirations 56–66 per minute. No cyanosis. Breath sounds weak. Rhonchi everywhere. Skin hot and dry. Temperature 101·2° to 103·8°. 29th: Child looks ill and is rather grey. Eyes sunken. Delirious last night. Signs of bronchitis still present. No vomiting. But child has passed several stools, which are very loose, of a light yellow colour, and very suggestive of typhoid stools. Patient complains of abdominal pain, but the abdomen is not distended, and there are no spots. The spleen, of rather soft consistency, is palpable one inch below the costal margin. Grünbaum-Widal reaction is negative. Respirations 48 to 60; pulse 132 to 168; temperature 101° to 105°. Nov. 5th: Spleen still palpable. No spots, and stools still loose, of a light-yellow colour, and containing digested food. White blood count 10,500 per cubic centimetre. Temperature 101° to 104°. 8th: Two choroidal tubercles discovered in the left fundus oculi on outer side of the optic disc. (Fig. 2.) None visible in the right. 11th: The X ray report states that the diaphragm moves poorly on both sides. The tissue of the left lung is much less translucent than normal, especially about its middle part, where it is mottled. Enlarged bronchial glands are seen on the right side, where shadows radiate into the lung, and there is also some mottling into this lung. 18th: Child is growing weaker and the pulmonary signs are spreading. Temperature 92·6° to 93·8°; respirations 52 to 60; pulse

FIG. 2.

Case 3: Tubercles of choroid.

148 to 168. 23rd: The child died suddenly, death being preceded by a temperature of 101°.

Post-mortem examination showed miliary tuberculosis of lungs, liver, spleen, and kidneys. No naked-eye evidence of tuberculosis of the brain or meninges. The eyes, examined after hardening in formol-saline, presented the usual histological structure of miliary tubercle of the choroid. Tubercle bacilli were unusually numerous in some of "giant-celled systems."

Remarks.—Each of the foregoing cases, then, was an instance of acute tuberculosis, diagnosed as such by the discovery of tubercle of the choroid. In one, the diagnosis was made from an apical pneumonia; in another, from pneumococcal peritonitis; and in the third, from typhoid fever. The diagnosis in the last case was particularly difficult. The physical signs were not at all well marked, and at first pointed in the direction of pneumonia. There was no constipation, as usual in cases of acute tuberculosis. The stools averaged 2·22 per diem. The respirations ranged from a minimum of 36 to a maximum of 84 per minute and averaged 52·18 per diem. But there was no cyanosis. The chief characteristic of the temperature was its irregularity. On three occasions (Oct. 26th and Nov. 9th and 10th) it fell almost to normal. At night it usually rose to 103·2° to 105° F. and the morning remission amounted to 1° to 3°. The case looked much like one of typhoid fever until tubercles were discovered in the choroid and the Grünbaum-Widal reaction was discovered to be negative. The diagnosis then, and then only, appeared to be plain. I could multiply such cases almost indefinitely.

The cases described in this communication were all met within the course of a couple of months. This lends point to the truth of what I have always maintained—namely, that acute tubercle of the choroid is by no means an uncommon manifestation, if looked for in the right places and in the right way. It is scarcely likely to be met with in the ophthalmic out-patient department. Under ordinary circumstances, when an ophthalmic surgeon visits a children's hospital once or twice a week, it is not probable that tubercle of the choroid will often fall under his notice. But when an enthusiastic house physician systematically looks over his in-patients with an ophthalmoscope, then tubercle, in my experience, is not uncommonly found. The use of euphthalmin, and, in particular, the employment of an electric ophthalmoscope, are great aids. Nobody has emphasised these points more than Dr. Wilbur B. Marple, of New York,[2] who in examining the eyes of 13 babies affected with tuberculous meningitis found tubercle of the choroid in every one. Another point rightly insisted upon by Marple is the frequency of the examination.

It is sometimes forgotten that, next to the stethoscope, the ophthalmoscope is the greatest weapon of precision possessed by the medical practitioner. There is no greater

[2] The Ophthalmoscope, 1912, p. 559.

excuse for neglecting the one than the other. When the technical difficulties of the ophthalmoscopic examination are great (and that is admittedly often the case), I personally never hesitate to have a little chloroform given, in order to facilitate the process. In that event the speculum and the fixation forceps may have to be used.

The diagnostic value of chronic tubercle of the choroid is also great, although I do not touch on that matter in the present communication.

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TRENCH PYREXIAS: THEIR PREVENTION AND TREATMENT.

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DURING August, 1915, and the succeeding months "pyrexia" was of common occurrence among officers and men who were living either in trenches, or billets (usually deserted villages), close behind the firing line. Prior to August the cases occurring regimentally were very few indeed compared with those seen during the winter months, and this rather suggested that flies, which were numerous about the trenches during the summer months, had very little to do in the propagation of the diseases of which this pyrexia was a symptom. There seemed to be no predilection for men attacked.

The pyrexia was sufficient to render a man temporarily unfit for duty, and while in trenches these men were at first sent to the field ambulances. The diagnosis made in a number of these cases was pyrexia not yet diagnosed. Some were sent to casualty clearing stations, evidently suspected cases of paratyphoid infection, others after a week's rest were returned to their units, only, in quite a percentage of cases, to relapse. A noticeable feature during the later months of the year was the rapid spread of this pyrexia when once started, and the serious problem arose as to what should happen if the disease became epidemic.

A search and inquiry was then undertaken to ascertain the cause; it could not be ascribed to the water or the food, judging by the condition in which the latter reached the trenches. Trenches and dug-outs were investigated, and the histories and symptoms of the men suffering with pyrexia were thoroughly gone into. Three diseases associated with pyrexia differing clinically were isolated, and briefly they are as follows.

A. Preceding the onset there is a feeling of malaise, with, in some cases, slight soreness of the throat; this usually lasts some 36 hours. It is followed by pyrexia, often 103° F., but rarely higher, headache, anorexia, and a feeling of having been "beaten all over." These symptoms were invariably accompanied by constipation, the bowels not having moved for three or four days, sometimes longer. The condition resembled in almost every detail what in England is known to the laity as "flu." It is difficult to ascribe a cause to this disease, but it must be remembered that these men were living in trenches under trying conditions, and, further, while in trenches there is a tendency for men not to go to the latrine. A number of men have been hit while on the latrine, and others in consequence prefer to wait until they come out of trenches. Hence constipation, coupled with trench life, might act as a strong predisposing factor.

Treatment.—A smart purge in the form of pill No. 9, with magnesium sulphate ℥ ij., followed by sodium salicylate gr. x. t.d.s., rapidly brings down the temperature and disperses the symptoms. An iron, arsenic, strychnine, and quinine pill given three times a day after food for three or four days is sufficient. The condition shows no tendency to recur, and I have not found it necessary to send a man to hospital.

B. The symptoms of this class are:—(1) Extreme sudden onset by day or night; (2) pains at the back of the eyes, with dizziness and often a fainting fit; (3) pain in the "shin bones," thighs, and small of the back; (4) pyrexia ranging from 103° to 104°; (5) a rapid and often irregular pulse; and (6) profuse sweating. A noticeable feature about this class of case is the clean moist tongue. These men can take food and digest it. Constipation and diarrhœa have been present with equal frequency; rarely have the bowel functions been normal.

Men suffering with this complaint show a marked tendency to relapse, even after eight or ten days. The period of incubation is, I think, short, though this is difficult to say with certainty. Contacts, however, have invariably reported with the symptoms well established 36 to 48 hours after removal of the affected case. This was the general rule. Cases with these symptoms sent to field ambulances returned at the end of a week, and such cases invariably relapsed. An excellent and most interesting article, by Captain J. W. McNee, R.A.M.C., and his colleagues, has appeared[1] describing this disease. These observers conclusively prove that it may be excluded from the typhoid group; they also noticed its contagious nature, and their work goes to prove that it can be transmitted from man to man through the corpuscles. The rapidity of the spread of this particular condition in trenches and billets close behind the firing line was one of the serious problems with which regimental medical officers were faced.

With regard to its causation there are the following facts: 1. The occurrence of the disease was greatest during the time that conditions in the trenches were worst. 2. On getting back to clean huts in the rest billets, where the men could get a bath, a clean change of underclothing, and could have their uniforms and blankets disinfected, the number of cases fell immediately. 3. On coming away from trenches for a month to a place where personal hygiene could be thoroughly carried out it was a simple matter to eradicate it. There is therefore, I think, strong presumptive evidence that this is a louse-borne disease, for whenever it was possible to carry out measures for the eradication of lice the number of cases invariably fell to a minimum.

A further noticeable feature about this class of case was that as soon as the temperature fell these men were fit to resume duty; the pyrexia and sweating did not "take it out" of the men to anything like the extent that one would have first imagined. This I noticed especially in my own case. As the numbers of the unit had dwindled I decided to treat these cases regimentally, and also to adopt prophylactic measures for men who had not been affected.

Treatment.—The main treatment aims at prevention, and this can best be done while men are in rest billets. The first step is to eradicate lice, scabies, and pediculosis pubis. The men are sent to the baths, procure clean underclothes, and also have blankets and uniforms disinfected; at the same time an inspection for scabies and pediculosis pubis is carried out, and these, if present, get appropriate treatment. Each man is given a purge in the form of a No. 13 pill, and quinine sulphate gr. v. is given in the evening. This is repeated the following evening, and on the third evening quinine sulphate gr. ij. is given to each man. This treatment, though simple, proved a most satisfactory preventive measure, and the result was an occasional sporadic case in a mitigated form.

When once the disease has established itself the two drugs par excellence have proved to be quinine and sodium salicylate. These men are given a brisk purge in the form of two No. 9 pills; quinine sulphate gr. xv. and sodium salicylate gr. xv., are given with brandy ℥ i. The temperature invariably falls in 24 hours with a sweat. If the quinine is borne well a further gr. x. is given the next day, and Dover's powder gr. x. with it. On the following day quinine gr. v. is given. With each dose of quinine sodium salicylate gr. x. is administered. After this, for four or five days, the iron, arsenic, strychnine, and quinine pill is given three times a day. With this treatment there has been no relapse. The most persistent symptom is the pain in the shins, but with massage and allowing the soldier the use of linimentum terebinthinæ, this aggravating symptom gets less and disappears about the fourth or fifth day.

C. This class of case shows a pyrexia ranging from 102° to 103° F. and associated with an acute form of diarrhœa, with blood and mucus in the stools. This was especially prominent during the winter months. There was no tendency to relapse and the temperature rapidly came down to normal with treatment. The food and water were carefully investigated and nothing could be found here which would cause the disease.

I think a possible explanation might be found in the trench rat. This rat is a large coarse animal, very foul-smelling, and evidently living on decomposing organic matter. Occasionally these vermin would attack any food

[1] Brit. Med. Jour., Feb. 12th, 1916.

that was lying about, but invariably they showed a preference for decomposing organic material. On one or two occasions there was noticed an epidemic of disease among them, and this was associated with a desire for water. They could be seen drinking the water from shell-holes, and it was apparent that they were in a diseased condition. Frequently a number of dead rats would be found in the open in the morning. These rats would creep into the dug-outs for warmth, and often soldiers have awakened to find one of these animals asleep under their blanket. A signaller awoke to find a rat asleep on his neck, and on another occasion a man was awakened by two rats fighting in the space between himself and his comrade. It will thus be seen how fearless of the human being these animals are, and therefore how near they could come to disseminating any infectious fleas or material that they might carry on their bodies. They are very numerous, and I think it highly possible that they may be the cause of this type of pyrexia associated with diarrhœa. This, however, needs confirmation.

Treatment.—Castor oil ℥j. is given to start with. As soon as this has been effective chlorodyne ℥j. in brandy ℥j. is given, with bismuth salicylate gr. xv. three times daily. If the diarrhœa persists, tinct. camph. co. ♏xx. is given with the bismuth. As a rule both diarrhœa and temperature rapidly subside, and there is no recurrence.

ON THE DRESSING OF SEPTIC GUNSHOT WOUNDS.

BY W. B. DAVY, M.R.C.S. ENG., L.R.C.P. LOND.,
CAPTAIN, R.A.M.C. (T.)

LOOKING back on a year's work at a base hospital, where there has been the opportunity of observing wounded patients and the progress of wounds from 48 hours to an indefinite period after their infliction, I am deeply impressed with the fact that is forcing itself upon me, that from a therapeutic point of view the dressing, or rather the re-dressing, of a septic wound is as unnecessary as, and much more harmful than, the re-dressing of a wound that is expected to heal by first intention. I have come to recognise that a re-dressing is of diagnostic value only, and that it is the last diagnostic test that should be applied. A re-dressing should be looked upon as an operation only to be undertaken after careful thought, and an unnecessary dressing should be regarded with as much regret as an unnecessary operation. Most re-dressings are entirely unnecessary, and it is the better recognition of this that is my plea.

Where drainage has been established in a septic wound it matters not with what antiseptic the surfaces of the wound are dressed; while drainage is maintained the wound will improve, and the corollary is also true. Where drainage is not maintained it is useless to try to improve matters by re-dressing; it is not a dressing that is needed, but an operation. The time factor in re-dressing is of no importance whatever; suppurating wounds may advantageously be left to stew in their own juices.

In this memorandum it should be understood that by a dressing is meant the removing and renewal of a dressing in direct contact with the wound surface. Pus and other discharges passing through this "next to the wound dressing" need to be absorbed for reasons of cleanliness and comfort. The absorbent should be renewed as frequently as may be necessary, the "next to the wound dressing" being left in position while the clean absorbent is placed over it. Thus is caused the minimum of discomfort to the patient and the healing process is not retarded at all by interference.

A septic wound progressing satisfactorily excretes profusely, and this excretion is entirely non-toxic to the patient; it is, as it were, outside the patient. While the wound is kept free from pus retention and from fresh abrasions such as are perforce inflicted when an adherent dressing is changed, no toxic effects will be produced even though evil-smelling pus be bathing the wound in its deepest recesses. I would go further and suggest that no application has been devised which promotes so rapid and prolific a growth of healthy granulations leading to well-organised tissue as laudable pus

It is interesting to note that the smell, worse during the first ten days, often practically disappears during the next ten, until only a faint mousy odour remains. "Eupad" liberally sprinkled between the layers of absorbent packing is of considerable use in reducing this smell; it is to be regarded, not as an essential of treatment, but as a concession to the olfactory senses which is appreciated alike by patient and attendants.

I append brief notes of cases of septic wounds in which the dressings were not touched for various periods. The method of dressing adopted was as follows—e.g., the dressing of a septic gunshot wound of the thigh, "through and through" after operation. Salt tablets disinfected in tincture of iodine are placed at intervals of about 1 inch on a strip of four-layer gauze 1½ inches wide; this is twisted into a necklace. The utmost care is then taken to pack firmly this necklace into every hole and corner of the wound. Over this is placed a pad of eight-layer gauze; this may be fixed to the skin advantageously by adhesive strapping in order that in the time to come the "next to the wound dressing" may be left undisturbed. Over this is placed cotton-wool maintained in position by firm bandaging, and the limb is supported in a splint to ensure rest.

The objects in view are: 1. To bring into contact with the wound surfaces a strong saline solution. 2. Temporarily to keep apart the wound surfaces, creating as large an area as possible for tissue drainage. 3. To obtain a condition of local rest, the internal packing of salt and gauze, in conjunction with the firm external bandaging, acting as a local splint. As the salt dissolves the tissues tend to resume their normal position, leaving a gauze drain to every part of the wound. 4. For the gauze to maintain a track along which the exudates may find their way to the surface.

Subsequently as the swelling of the limb subsides and the salt tablets dissolve the bandage should be tightened, opportunity being given for this when the soaked absorbent is renewed. When it is necessary for investigation or for further treatment to remove the dressing, the gauze drain soaked in slimy pus will harmlessly and painlessly slip out of the wound. For the redressing of a granulating wound it is merely necessary to lead in a thin drain of gauze to the innermost parts and to cover with a pad of gauze and absorbent.

In observing serious cases treated on these lines, one is as much struck by the marked improvement in the patient as by the rapid improvement in the wound itself. That this may be due to the elimination of the physical and mental strain involved in frequent dressings has been suggested to me by patients who volunteered the remark that they had had no chance to "pick up" between one dressing and the next. This factor of the wear and tear of the patient's energies involved in a big dressing is a point, too, to be considered. If the results obtained by infrequent dressings are placed even at so low an estimate as only to equal the results obtained by the more ordinary methods, preference should be given to the method which diminishes the sufferings of the patient.

CASE 1.—Private; gunshot wound of head. On admission on March 21st, 1916, patient was in a dazed condition and could give no account of himself. Temperature 98·8° F.; pulse 48. There was an extensive and œdematous scalp wound. On the 22nd the wound was excised; no bony injury was apparent, but taking into consideration the slow pulse and the dazed condition the skull was trephined. The inner table was found to be fractured. There was blood clot in the diploë; the dura was uninjured and pulsated, but was slightly less pink than usual. A small incision was made in the dura; a tablespoonful of mushed brain and blood clot evacuated itself. A tube was inserted down to the dura. On the 23rd dressed with eusol. On the third day after operation patient had two epileptiform fits, and during the succeeding 12 hours eight more fits occurred. The wound was then reopened, the tube removed, and a spirit dressing applied. The wound suppurated, and in the following days smelt badly. On the 29th absorbent was changed, but the dressing was left unchanged for 11 days (April 5th); on the 7th again dressed. During this period patient steadily improved, temperature remaining normal and pulse becoming normal. On removing the pus poultice the wound was practically healed. Patient transferred to hospital ship on April 10th.

CASE 2.—Private, aged 19; gunshot wound of left arm, compound fracture of humerus. Admitted on April 29th, 1916. Temperature 99·4° F. Wound dressed. It was considered that sufficient drainage had been made by the

missile; however, the temperature (oscillating from 98·6° to 103°) and pulse remained unsatisfactory. The dressing was removed on the seventh day after admission and new drains were inserted. The following day hæmorrhage occurred. An anæsthetic was given, but on removing the dressing the bleeding was found to have ceased. Drains were again inserted on this date. Further dressings were unnecessary, patient's temperature and pulse returning to normal, and remaining normal for a period of 14 days, during which time the dressing was not touched. He was transferred to hospital ship on May 20th.

CASE 3.—Private, aged 29. Admitted on May 18th, 1916, with a large (10 by 5 inches) and freely suppurating flesh wound of the back, extending to the crests of the ilia; muscles exposed over whole area. Wound dressed. The patient was nursed in a prone position. For the first five days the temperature oscillated—morning 99° F., evening 102·2°; the pulse averaged 84 per minute. The steady pulse-rate permitted of leaving the dressing unchanged. During the next five days the temperature was—morning 99°, evening 100°; pulse averaged 76. On removing the dressing ten days after admission healthy granulations had filled in the wound flush with the skin, and the silvery line of advancing epithelium surrounded the wound ½ to 1 inch from the skin margin. Dressed again on June 1st, when patient was discharged.

CASE 4.—Private, aged 21; gunshot wound of left fore-arm, compound fracture, and flesh wound of left thigh. Admitted on April 29th, 1916. Temperature 99° F.; wounds dressed. Forearm dressed on May 1st. On the fourth day ordinary drainage operation, the indication for this being the swinging temperature (99°–102·2°) with pulse-rate averaging 104 On the third day after operation, the temperature and pulse showing but little improvement, the dressing was removed for investigation. Two days later another dressing was effected; this was unnecessary and should have been recognised as such by the lessening swing of the temperature and the diminishing pulse-rate. Patient now rapidly improved, pulse and temperature remaining normal until his transference to hospital ship on May 20th; wound not dressed. The dressing had been left *in situ* for 11 days.

CASE 5.—Lance-corporal, aged 22; gunshot wound of right arm, compound fracture, and of left forearm, compound fracture; two fingers amputated; fracture of upper jaw; double fracture of lower jaw. Admitted to this hospital on May 11th, 1916, nine days after injury. On admission the wounds were dressed; all were suppurating. Temperature and pulse normal. Fifteen days later (previous to patient's transference to hospital ship on May 27th) the wounds were again dressed and had made very satisfactory progress. Patient's general condition had considerably improved, temperature and pulse remaining normal during his stay in hospital.

CASE 6.—Private, aged 24; compound fracture of humerus, elbow-joint involved. Admitted on April 9th, 1916; temperature 101° F., pulse 118; wound dressed. On the 11th wound dressed; an arm bath was also given on this date and at other times, the last being on the 30th. On the 12th several large pieces of shattered bone were removed through the wounds on either side of the elbow; at this time temperature was swinging (103°–100°), with high pulse-rate. During the next fortnight the wounds were re-dressed every day or so. At the end of this time (April 26th) more bone was taken away to allow more efficient drainage. His general condition had deteriorated; temperature 101·4°–98°, pulse-rate keeping over 100. Patient had a good movement of his fingers, and on this account amputation was delayed. In the next three days (three weeks after admission) his condition became very critical, and at the last dressing at this time but little hope was entertained of saving his arm, the patient begging to have it amputated. However, his condition now slightly improved day by day and in another week rapidly improved. The dressings and splint became soaked with discharge, but in a fortnight he was up and walking about the ward feeling comfortable and looking the picture of health. When the wound was dressed after an interval of three weeks the two large wounds on either side were filled with firm granulation tissue with the exception of a sinus leading down to the ends of the bones from each side. Epithelium had covered large areas of the newly formed tissue. The temperature had been normal since May 3rd. Patient transferred to hospital ship on May 26th, on which date the wound was dressed.

CASE 7.—Private, aged 21; gunshot wound of right thigh, compound fracture of femur. Admitted on April 29th, 1916. A through-and-through wound. The femur was comminuted. The thigh and leg were well supported and extended on a Jones's splint. During the first ten days the wounds were dressed three times. The temperature was swinging daily (101°–98·4° F.); then the pulse-rate and temperature returned to, and remained at, normal. The wound was re-dressed after 16 days' interval, and the patient transferred to hospital ship on June 1st, when the wound was dressed.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

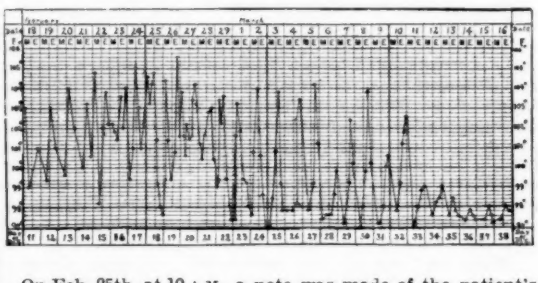
A CASE OF PERSISTENT FEVER.

BY G. L. TURNBULL, M.A., M.D. OXON.

THE temperature chart of the following case seems to be sufficiently interesting to put on record. The striking feature of the illness was that, notwithstanding the violent fluctuations of temperature, the patient did not appear really very ill at any time, nor did she feel so, except during the sudden rises of temperature.

History of present illness.—On Feb. 8th the patient, aged 27, previously perfectly healthy, began to have a heavy "cold in the head and cough" with a rise of temperature, but of this no record was kept. She stayed in bed next day and the following few days, until the 14th. On the 16th she went out, still having a cold and a cough. There was no expectoration. She thinks her temperature was ranging from 100° to 101° F. She went to bed again on the 17th with a temperature of 103°. There had been no headache or muscular pains throughout. On the 19th I was called to see her. She then had no coryza, but had a slight cough. The tongue was clean, the temperature was 103°, and the pulse rate 108. On examining the chest the heart sounds were normal. A few slight catarrhal (bronchitic) râles were heard over the base of both lungs. There was no sputum. The abdomen was normal. The appetite was fairly good. In the throat nothing abnormal was seen.

Progress of the case.—The bronchial râles disappeared in a few days, and from that time onwards no new sign developed. The temperature oscillated between normal and 105°, and each considerable rise was accompanied by a definite rigor. Throughout the illness the appetite was good.



On Feb. 25th, at 10 A.M., a note was made of the patient's condition that it was very good, considering that her temperature was between 104° and 105°. The pulse was 120 and regular, respirations 28, and the tongue was moist and not furred. The patient had taken her food well. In lungs and heart nothing abnormal was detected. On the 24th a catheter specimen of urine was obtained, and the report from Dr. G. L. Eastes's laboratory states that no bacteria were found in stained films. On incubation there was no growth indicative of infection of the urinary tract. On the 26th specimens of blood were taken and examined by the agglutination test for typhoid, paratyphoid A, and paratyphoid B with a negative result. On the 25th 10 c.c. of blood were withdrawn from the arm by Dr. A. P. Beddard, and six cultures made at the same laboratory. All the cultures remained sterile except two in which staphylococci grew, which were considered accidental contaminants. On the 28th the following report on the blood was obtained: "Red corpuscles, 3,925,000 per c.mm.; white corpuscles, 4500 per c.mm.; hæmoglobin, 74 per cent. of the normal; colour index, 0·9. Differential count of 300 white corpuscles: Small lymphocytes, 11·7 per cent.; large lymphocytes, 5·8 per cent.; polymorphonuclears, 82·7 per cent.; eosinophiles, 0·0; mast cells, 0·0. There is no poikilocytosis or polychromatophilia. No abnormal cells are found. No malarial parasites are found."

On March 3rd another examination showed the number of white corpuscles to be 14,500 per c.mm. Differential count: Small lymphocytes, 14·3 per cent.; large lymphocytes, 2·3 per cent.; polymorphonuclears, 83·4 per cent.; eosinophiles, 0·0; mast cells, 0·0. On the 22nd a swab from the pharynx revealed nothing of importance. Cultures made from it showed neither influenza bacilli nor pneumococci.

With regard to medicinal treatment, quinine in 3-grain doses every four hours was given on Feb. 25th and 26th, but failed to prevent rises of temperature and was discontinued. On Feb. 27th and 28th small doses of strychnine were given hypodermically. Aspirin was taken during the first ten days of the illness. Phenacetine in 5-grain doses was given on Feb. 25th and 26th, three doses in all, and then stopped. On March 11th, at Sir Thomas Barlow's suggestion, quinine was again begun in doses of two grains three times a day and continued for a week.

The patient made a complete recovery with rapid convalescence.

The chief interest of this case lies in the diagnosis. First of all it was thought, owing to the catarrh and fever at the onset, to be an influenza. When the temperature began at about the eleventh day to be accompanied by rigors the possibility of ulcerative endocarditis was taken into consideration. But no heart murmurs were heard at any time, nor did the patient present the appearance of such a case. It was hoped that examinations of the blood would give some clue. It certainly enabled us to exclude typhoid and paratyphoid and any form of malaria. The possibility of local suppuration was duly considered, but no focus of mischief could be discovered either in the mouth or abdomen. Digital vaginal and rectal examination revealed nothing. Nor did the blood counts give any assistance. The urine again was sterile, so that pyelitis could be excluded. Finally, the blood cultures gave us a negative result. But all the same it is possible that some form of septicæmia was at the bottom of the trouble, and that at the moment the blood was withdrawn no bacteria were present. This seems to be the most probable explanation, and the case may have been one of pneumococcal septicæmia.

I have to thank Dr. Beddard for his valuable advice and assistance, and also Sir Thomas Barlow, who kindly saw the patient with me towards the end of the illness.

Ladbroke-square, W.

BAYONET WOUNDS OF THE CHEST:

A REMARKABLE CASE OF TENACITY OF LIFE.

By SYDNEY D. RHIND, M.R.C.S., L.R.C.P.

IN a friendly bayonet match Trooper —— accidentally received two thrusts in the chest, from the effects of which he subsequently died. Seen three-quarters of an hour after the accident, the patient was suffering from a left-sided pneumothorax and internal hæmorrhage, and from the wound in the left side were protruding about 4 inches of colon and mesentery. He was extremely dyspnœic and vomited several times. An abdominal section was performed under general anæsthesia. A little blood, but no stomach or intestinal contents, was found in the abdomen, and no bleeding point or injury to stomach, spleen, or other viscus was discovered. The patient was transfused throughout the operation, which lasted half an hour, and he lived for 6½ hours afterwards, dying from internal hæmorrhage.

On post-mortem examination it was found that the first wound, beginning in the ninth space in the left mid-axillary line, passed through the pleural cavity and diaphragm into the abdomen and pierced the fundus of the stomach, then through the diaphragm again into the right ventricle, injuring the septal cusp of the tricuspid valve, through the right auricle, and ended just beneath the skin above the right nipple. The second wound punctured the base of the right lung. Each wound in the heart would comfortably admit the index finger. Both pleuræ were full of blood.

It is astounding that a man should survive for 8½ hours and live through a severe operation with two large wounds of the heart and a hæmopneumothorax on one side and a hæmothorax on the other.

POLIOMYELITIS IN SCOTLAND.—Dr. A. Maxwell Williamson, medical officer of health for Edinburgh, informs us that there has been no outbreak of acute poliomyelitis in his district. In view of the outbreak in Aberdeen and the consequent apprehension of a spread of the disease to other large centres, he thought it advisable to issue a public statement to this effect, adding that in the event of any cases occurring in Edinburgh preparation had been made to deal with them and to supply the needful hospital accommodation.

Reviews and Notices of Books.

Principles of Diagnosis and Treatment in Heart Affections.

By Sir JAMES MACKENZIE, M.D. Edin., F.R.S., &c. London: Oxford University Press. 1916. Pp. 264. Price 7*s.* 6*d.* net.

Sir James Mackenzie, in epitomising the principles which underlie his teaching, introduces us to the present position of teaching and of practice in relation to heart affections. The book is opportune. The rousing of the whole nation to a pitch of utmost physical and mental effort needs must lead to a degree of strain to determine the consequences of which will devolve upon the medical profession. Upon the medical profession also will fall the burden of undertaking the appropriate treatment of those individuals, both men and women, whose power of response to the unusual demand is found to be inadequate. Already it has become apparent, as might have been expected, that the heart and the nervous system, representing the two master tissues of the body, are feeling the brunt of the strain most and are yielding in consequence. Practitioners will need all the help they can be given in the routine examination of their patients to enable them to estimate aright the meaning of the signs and symptoms which a close investigation reveals. Following the terminology of the author, is such and such a finding "physiological," or is it "functional," or is it "organic"? These are the questions that will come up for solution again and again. Upon the doctor's answers to them will depend the duration of rest advisable before the soldier returns to active service or the woman to her war work, the decision that they shall not return at all, and the form of treatment that shall be adopted. It will be more and more a day of symptoms and less and less a day of signs, and if we are to do the best for the immediate future of the race we shall be careful to study these early evidences of disease that are being presented to us in rapidly growing numbers.

In the investigation of affections of the heart we owe to Sir James Mackenzie a great advance in our knowledge of many of the early signs and symptoms met with in the investigation of our cases. Out of the chaos of heart irregularities, to name one important group of signs, this worker has produced a reasonable order of things which, at the least, is very valuable as a suggestive basis for methodical observations. Like all truly scientific minds, Mackenzie holds his conclusions lightly and is prepared to accept different ones should these better fit the facts; and he makes a frank admission that some of his facts must wait for further associations and more abundant repetition before their full meaning becomes clear. The introduction of systematic graphic methods of recording the movements of the heart and blood-vessels, with a special notation for the curves thus obtained, has given an enormous impetus to the study of the more obscure forms of heart disease, and Mackenzie's own life-work in this direction has become an established precedent all over the world. The chief value of this instrumental work, which must necessarily be largely of a research nature, is to act as a criterion for simpler clinical observations and as a guide to further investigations. Mackenzie's long and painstaking observations have led him to conceptions with regard to the cardiac muscle, its functional vagaries, and its organic changes that serve to illumine the darkness which shrouded this subject up to a few years ago. It was known that upon the integrity of the myocardium ultimately depended the power of the heart to respond to effort and to pursue its necessary work in the face of valvular defects. But very few observers laid themselves out to study the signs and symptoms of commencing failure of this myocardial integrity, and fewer still were able to record any observations that took us beyond the entrance to this unexplored domain. Mackenzie has made a path well beyond the entrance into a region that promises great rewards for patient and observant research.

The book before us restates in lucid and characteristically emphatic language the attitude of the author towards these questions, and sets out the manner in which he advises a practitioner to approach a case of suspected heart disease. The book presents in succinct fashion the matured teaching of

its author. The several chapters were written for a series of lectures to post-graduate students and others; the colloquial form of expression, purposely retained, adds point and force to the book. The introduction of a number of aphorisms, printed in heavy type as the headings of the subsections, may be of great value to future writers. The personal note is frequent in the book, and such pioneering work as is here presented justifies this. Into the more critical paragraphs there creeps a slight hardness which is perhaps to be regretted, seeing that the prophet has long since received his mantle.

We heartily recommend every practitioner to peruse this book and to incorporate its teaching thoroughly with his present knowledge. To what degree he shall permit himself to base the whole of his ideas on the subject of heart affections upon its teaching we leave to his own judgment. Were the book intended primarily for the student, which it very wisely is not, we should have some definite advice to offer. Suffice it to say, that Mackenzie's invaluable lectures are an amplification of, rather than a substitute for, the better known and older expositions upon the same subject. Good work is good for all time, not merely for the day on which it is done. If the foolish embellishments and the confusing ambiguities by which the results of the older methods of clinical examination of the heart and blood-vessels were so often spoilt be omitted, there is no observation elicited by their means which is incompatible with the observations made by Mackenzie and his co-workers. Nor is the doctrine of valvular lesions, "compensated" and "uncompensated," with their effects upon the circulation, incompatible with the teaching of the school whose *motif* is "heart failure" in its various grades and with its divers results. There is a danger that the student, with his bias towards the new and the untried, will consider the older methods to be either no longer necessary or unreliable. Already he tends to talk in terms of "extra-systoles" and "auricular fibrillation" the while he omits accurately to localise the apex beat or to note the size of the pulse at the wrist. No doubt an undue importance has been ascribed to heart murmurs, and the student's mind has been given too partial a view as to their significance by some teachers of medicine. But there have always been those who warned him against forming conclusions from a single physical sign, be it a systolic murmur, bronchial breathing, or a high blood pressure. It is right to pin his attention down to the crude facts of the clinical examination, because his salvation lies in his teachers making as much use as possible of the brief opportunities given them to train his powers of observation. That the average student is sent out into the world with these crudities still representing his whole knowledge of the effects of disease is one of the acknowledged faults of our medical curriculum. Nor does it concern only his knowledge of heart affections. And yet it is doubtful if anything except responsible practice can fit him for judicial consideration of the truth of many of the statements in the book now before us. Which is probably what Sir James Mackenzie himself has in mind when he asserts as the first aphorism in Chapter I., "The progress of medicine will be hampered and delayed till the general practitioner becomes an investigator."

LIBRARY TABLE.

1. *The New Public Health.* By HIBBERT WINSLOW HILL, M.D., D.P.H. New York: The Macmillan Company. Pp. 206. Price 5*s.* 6*d.* net.—2. *Fighting Dirt.* By ERNEST HOOD. With an Introduction by S. S. F. FLETCHER, M.A. London: George G. Harrap and Co. Pp. 224. Price 1*s.* 8*d.*—3. *The Nation of the Future: A Survey of Hygienic Conditions and Possibilities in School and Home Life.* By L. HADEN GUEST, M.R.C.S. Eng., L.R.C.P. Lond., School Medical Officer, London County Council; Medical Superintendent, St. George's Dispensary and School Clinic; Temporary Major, R.A.M.C. London: G. Bell and Sons, Limited. Pp. 115. Price 2*s.* net.—These three books have the common and excellent aim to teach the public to think hygienically. Dr. Hill's book consists of the revision and expansion of a series of articles contributed in 1912 to the *Journal-Lancet* of Minneapolis. The articles, we learn from the preface, were furnished by the proprietor of this newspaper to the 1100 other newspapers in the United States and to 50 newspapers in Canada, so that the teaching of the book has already received wide publicity. The probability is that a great deal of good has been done thereby. A deliberately colloquial style has been adopted, and the lessons laid down lose nothing of their solid value from the author's raciness. Medical men could recommend to their patients no better book from which to get sound instruction on the dangers incurred by the community through disease and on the proper directions in which defence should be organised.—The second volume is an interesting and amusing little book, written by the head-master of the "mixed department" of the West Leigh Council Schools, Southend. The author's idea has been to tell the story of a crusade against dirt in military terms, the body being a fort and the mind the commander of that fort; the doctor's duty he depicts as being to strengthen the defences, the enemy being diseases of all sorts. The tremendous current events of to-day have been cleverly seized upon by Mr. Hood to illustrate pathological dangers, and especially those of unhygienic habits. For example, on two consecutive pages entitled "Dangers of the Air," on the one we have a sketch of a Zeppelin in full flight over a town, and on the other five people stifling in a railway carriage with the windows and ventilators shut. "Many people," says the legend under the latter picture, "regard the airship as the greatest danger of the air. They are wrong. The greatest danger of the air is a poisonous gas which accumulates in rooms and railway carriages when the occupants keep windows and ventilators shut. As a guide to hygiene for popular use this little book has great merits.——Major Haden Guest has put together in book form some interesting papers comprising a survey of the hygienic conditions and possibilities in school and home life. The papers were published separately before the war, but their collection as a book was corrected at the front, where the author was able to appreciate that only proper care of the children can yield a high percentage of strong adults. Major Guest knows his subject and writes clearly and well.

Modern Medicine and Some Modern Remedies: Practical Notes for the General Practitioner. By THOMAS BODLEY SCOTT. London: H. K. Lewis and Co., Limited. 1916. Pp. xv. + 159. Price 4*s.* 6*d.* net.—Dr. J. B. Scott has written these essays at odd times and in odd places during his life as a busy general practitioner, and in a little apology claims for them the forbearance and sympathy of professional brethren. The essays require no apologetic introduction; they are sound, practical, and clear contributions to the understanding of disease. We agree with Sir Lauder Brunton, who contributes a brief preface to the collection, that few if any medical men will rise from its perusal without knowing something of which they were previously ignorant. If other men qualified like Dr. Scott will follow his example and write down the results of their experience, the medical profession will gain greatly in knowledge and patients will benefit by practical improvements in general and special therapeutics. The valuable work done by many general practitioners is very usually known only to patients in the district who have directly benefited by it, and to certain consultants who at different times have been summoned into counsel, and we may repeat here a regret, registered on previous occasions, that the experiences of those who conduct large private practices are seldom put on record. The lessons in therapeutics of a general sort which they could impart do not lend themselves to literary shape, while the contents of their case-books cannot, for obvious reasons, be used with the freedom of hospital reports. But the conduct for many years of a great general practice, in the scope of whose working persons of all classes suffering from innumerable ills are included, gives the practitioner a knowledge not only of pathology and therapeutics, but of men and manners, the fruits of which knowledge the medical profession would gladly share. Dr. Scott, by presenting his experiences in the form of general memoranda, written out of ripe experience, has produced a useful little book of essays.

The Purpose of Education: An Examination of the Education Problem in the Light of Recent Psychological Research. By ST. GEORGE LANE FOX PITT. New edition, with preface by EMILE BOUTROUX, de l'Académie Française. London and Cambridge: Cambridge University Press. Pp. 144. Price 2*s.* 6*d.* net.—In this small book Mr. Fox Pitt examines the problems of education in the light of recent psychological research. He has considerable familiarity with what

experimental psychology has done in recent times, and with the stress he lays on the educational value of high ideals we have every sympathy. The preface contributed by Professor Emile Boutroux in the form of a letter is translated by Dr. H. Wildon Carr, and the following passage therefrom may be taken as a suggestive intimation of Mr. Fox Pitt's teaching. "Let us not fear then to affirm that the essential object of education, particularly at this present time, is the reconciliation of science, which makes us know the action of the environment or of things on the human consciousness, with religion which gives to our inner dispositions their highest and most beautiful form. Instinct and science are capable of themselves of contributing greatly to this reconciliation. But the work is the supreme and essential function of reason, in whose regard whatever is, has, as Aristotle has said, its principle in the intimate unity of what is supreme both as intelligible and as desirable." We commend this small book to all thoughtful readers.

The Psychology of Relaxation. By GEORGE THOMAS WHITE PATRICK, Ph.D. Boston and New York: Houghton Mifflin Company; Cambridge: The Riverside Press. 1916. Pp. 280. Price 5*s.* net.—Dr. Patrick, who is professor of philosophy in the State University of Iowa, has written an interesting book and written it well, but it has not at the present moment much appeal to this country. We are living in times when, however much we may desire not to work under pressure, we feel that in this way only can our work be done. It is true that Ruskin said that many of the great things of the world have been done with great ease and not with great effort, but it is also true that a great deal of what that eloquent and brilliant man said has not been found to hold water. None of the parties to the world-war would subscribe to the view that operations can be carried on without the most strenuous struggle—anything in the form of relaxation of strain would be fatal. Certain of the chapters in this book received wide notice when they appeared in various periodicals, for the author is an able and amusing writer. The last chapter is on war, and the author does not seem to be competent to write about the subject.

The Adolescent Period: Its Features and Management. By LOUIS STARR, M.D., LL.D. London: H. K. Lewis and Co., Limited. 1916. Pp. vii. + 211. Price 4*s.* 6*d.*—This book consists of notes on the physical and psychological changes which may be met with in the period between childhood and adult age. We do not know upon what evidence the author bases a statement that the years immediately before and after puberty are marked by much bad health and the many disorders of physical and mental changes incidental to development. He sets out rather an amazing list of these disorders, and we feel fairly certain that the medical practitioners in this country and the medical officers of our public schools would not support his estimate of their frequency or of their importance.

That Life is the Origin and Purpose of the Universe. By T. G. PALMER HALLETT, M.A. London: Cecil Palmer and Hayward. 1916. Pp. 75. Price 3*s.* 6*d.* net.—Mr. Palmer Hallett gives his title in the form of a thesis, and it is one that is little in dispute. We do not find that he throws any light upon the obscurer arguments in the tremendous proposition; rather he seems to darken counsel by his flow of words.

The Johns Hopkins Hospital Reports. Vol. XVII. Baltimore: Johns Hopkins Press. Pp. 586.—The seventeenth volume of these reports consists of eight long contributions on clinical and pathological subjects. They have been carefully selected, are for the most part excellently written and illustrated, and deal with subjects of great interest, as will be seen from the following selection of titles: "Free Thrombi and Ball Thrombi in the Heart" (Dr. Joseph H. Hewitt), "Benzol as a Leucotoxin" (Dr. Lawrence Selling), "The Origin and Development of the Lymphatic System" (Dr. Florence R. Sabin), and "Venous Thrombosis during Myocardial Insufficiency" (Dr. Frank J. Sladen and Dr. Milton C. Winternitz). The longest contribution in the volume comes from Dr. Frederick L. Hoffman, F.S.S., who narrates the statistical experience of the Johns Hopkins Hospital, Baltimore, from 1892 to 1911. This is a paper which every medical statistician ought to read, as much because it illustrates the difficulty of making accurate deductions from medical statistics as because of the information it contains. The Johns Hopkins Hospital Reports are among the very best hospital reports that now emanate from any medical centre. They are issued without regard to either labour or expense, and are a fine expression of American resolve to produce completeness regardless of cost in money or effort.

Macmillan and Another v. *Nursing Press, Limited, and Others.* London: The Proprietors of the *Hospital.* 1916. Pp. 85. Price 1*s.* net.—This is a full report of the trial of the action for libel brought by Messrs. Macmillan and Co., publishers and owners of the *Nursing Times*, and Miss Swanhilde Bulan, the editor of the paper, against the "Nursing Press, Limited," Mrs. Ethel Gordon Fenwick, and the Press Printers, Limited. The libels alleged were contained, it will be remembered, in articles which criticised the *Nursing Times* generally, and more particularly the employment as editor of Miss Bulan, a lady of German parentage, naturalised shortly after the commencement of the war. The jury returned a verdict for the plaintiffs and awarded £500 damages, the defendants undertaking not to publish in future anything similar to the words complained of. The trial took place before Mr. Justice Ridley in March, 1916, and, presumably, the interest taken by the nursing profession in the matters discussed is the reason for the issue of the shorthand report of the proceedings in volume form.

JOURNALS.

British Journal of Surgery.—We have received the third volume of this periodical. In several countries there are journals devoted to surgery, but the *British Journal of Surgery* need fear comparison with none. In matter, in printing, and in illustration it is extremely good, and the writers, the editor, and the publishers may all be congratulated on the result. Even in a time like the present, when the storm and stress of war might be thought to interfere with the production of such a journal, and when so many surgeons are engaged in the service of their country, it has pursued the even tenor of its way, and it has not in the least fallen short of the high standard which it set for itself in the first number. Every number of the *Journal* contains an account of some illustrious surgeon of the past, illustrated by an excellent portrait, and these accounts are of great interest and value, for in the rapid progress made by surgery within recent years and continuing at the present time, there is no little risk that we may be unmindful of the great deeds of our predecessors. It is only natural that in war time many of the contents should deal with war surgery, and these papers will prove of great value when the surgical history of this world-wide war comes to be written. Diverse are the views often expressed, for in this war we have met with many surgical conditions which have never arisen before, and those surgeons taking part in it have had to feel about to find the most suitable treatment for these new conditions. Some points have been settled, but others still remain in doubt. We would impress on all surgeons the need to subscribe to this journal, for it deserves vigorous support.

LITERARY INTELLIGENCE.

A TREATISE is announced by Messrs. J. and A. Churchill on "The Practice of Gynæcology," by Dr. Henry Jellett, the Master of the Rotunda Hospital. The volume is a fourth and enlarged edition of his previous book, "A Short Practice of Gynæcology," and contains many coloured illustrations.

Messrs. Masson et Cie (Libraires de l'Académie de Médecine, 120, Boulevard Saint Germain, Paris) announce the issue of a series of brief practical monographs on subjects connected with the medicine and surgery of the war. Three volumes have already appeared: 1. La Fièvre Typhoïde et les Fièvres Paratyphoïdes. By Dr. H. Vincent, army medical inspector, and Dr. L. Muratet, superintendent of the Faculty of Medicine at Bordeaux. 2. Les Formes Anormales de Tétanos. By Dr. Courtois-Suffit and Dr. Giroux; with a preface by Professor Widal. 3. Traitement des Fractures, Vol. I. By Professor Leriche (Lyon). With 97 illustrations. Other volumes promised by the end of September are: Traitement des Fractures. By Professor Leriche. Tome II. Le Choléra, les Dysenteries, le Typhus Exanthématique. By Dr. H. Vincent. Hystérie, Pithiatisme, et Troubles Nerveux. By Dr. J. Babinski and Dr. J. Froment. Psychonévroses de Guerre. By Professor G. Roussy and Dr. J. Lhermitte. Formes Cliniques des Lésions des Nerfs, and Traitement et Restauration des Lésions des Nerfs. By Mme. Athanassio-Benisty;

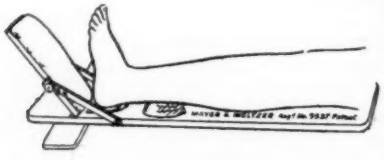
with a préface by Professor Marie. Les Blessures du Cerveau. By Dr. C. Chatelin. Le Traitement des Plaies Infectées. By Dr. A. Carrel and Dr. G. Dehelly. Traitement Opératoire des Plaies du Crâne. By Professor De Martel. Les Blessures de l'Abdomen. By Dr. J. Abadie. Les Séquelles Ostéo-Articulaires des Plaies de Guerre. By Professor A. Broca. La Prothèse des Membres en Chirurgie de Guerre. By Professor A. Broca and Dr. Ducroquet. Localisation et Extraction des Projectiles. By Professor Ombrédanne and Dr. L. Ledoux-Lebard. Each volume costs 4 francs.

Among the autumn announcements of the Cambridge University Press (Fetter-lane, London, E.C.) will be found the following:—Catalogue of Scientific Papers. Fourth Series (1884–1900). Compiled by the Royal Society of London. Vol. XV. Fitting-Hyslop. Collected Scientific Papers. By John Henry Poynting, Sc.D., F.R.S. Comptes Rendus of Observation and Reasoning. By J. Y. Buchanan, M.A., F.R.S. The Anthocyanin Pigments of Plants. By Muriel Wheldale. Growth in Length. Embryological Essays. By the late Richard Assheton, M.A., Sc.D., F.R.S. Illustrated with 42 figures. The British Journal of Psychology Monograph Supplements. No. IV. The Psychology of the Organised Group Game. With Special Reference to its Place in the Play System and its Educational Value. By Mabel Jane Reaney. With a Preface by Dr. Kimmins, chief inspector of the Educational Department, London County Council. Cambridge Botanical Handbooks. Edited by A. C. Seward and A. G. Tansley. Algæ:—Volume I.: Myxophyceæ, Peridinieæ, Bacillarieæ, Chlorophyceæ, together with a Brief Summary of the Occurrence and Distribution of Freshwater Algæ. By G. S. West, M.A., D.Sc. The Elements of Pain and Conflict in Human Life considered from a Christian Point of View. Lectures delivered at the Cambridge Summer Meeting, 1916. Europe in the Nineteenth Century (1815–1878). By John E. Morris, D.Litt. With 8 maps and 3 pedigrees. On the History, Life, Literature, and Art of Modern Russia. Lectures delivered at the Cambridge Summer Meeting, 1916. Edited by J. D. Duff, M.A.

New Inventions.

A LEG-SPLINT WITH ADJUSTABLE FOOT-PIECE.

OUR attention has been drawn by Captain J. W. Walker, R.A.M.C. (T.), to an improved leg-splint which, as shown in the illustrations, has a hinged foot-piece, allowing the foot to be washed and dressed without discomfort or injury to the leg. The foot-piece is held firmly by the side supports, which are easily released when desired. Pressure on the heel is prevented and the position of the foot can readily be changed so as to lessen the risk of stiffness of the ankle. The splint has been found useful in many cases under treatment at military hospitals at the present time. The inventor of the splint is Miss Grace Campling, Greenmead, Bexley, Kent.



A PNEUMATIC CRUTCH-TOP.

FOR men who require crutches for long periods the kind of crutch-top is a matter of great importance. Dr. C. R. A. Thacker sends a photograph and specification of a pneumatic crutch-top which has been suggested and made by Mr. R. C. Pierce, M.I.E.E., and has been found useful and efficient in cases of established and commencing crutch paralysis at the Wordsworth Grove Red Cross Hospital, Cambridge. The general build of the crutch is sufficiently shown in the photograph. The construction is given by Mr. Pierce as follows. A pair of ordinary crutches was taken and existing padded tops removed. A wood top made of basswood was fitted to each. Two wood discs of oak were turned and fitted to two supports with glue and wood screws. This was then varnished with shellac to prevent any porosity. A piece of rubber tube, being a part of an inner motor-car tube of suitable size, was then attached to each disc first with seccotine and then by binding wire. Over this was placed

an outer cover of cotton fabric so as to prevent the tube stretching, similar to the outer cover of a motor-car tyre, but, of course, quite thin; canvas fire-hose would probably be more suitable than the present sewn covers. A bicycle tyre valve was fitted to provide means of introducing air to any desired pressure, but low pressure of about 2 or 3 pounds per square inch seems best. This fitting was chosen because it was thought that in many cases more pressure might be needed than can be got from the mouth, and bicycle pumps are both plentiful and cheap. The inventor adds that it might be better to put the valve in the middle of the tube (as in motor-cars), as at the end it is liable to injury if the patient drops his crutch.

CONSUMPTION IN ABERDEENSHIRE.—Dr. Harry J. Rae, tuberculosis medical officer for the county of Aberdeen, has issued his second annual report, for the year up to December last. The death-rate from tuberculosis during the year was 103·2 per 100,000, 115 deaths from phthisis, 8 from abdominal tuberculosis, 18 from tubercular meningitis, and 22 from other forms of tuberculosis. Of these, 111 deaths occurred in the rural areas and 52 in the burghs. A large proportion of the cases were domestic and farm servants, as might be expected from the composition of the population and the fact that those classes are frequently overworked and badly housed. The report notes the need for charitable bodies to assist cases who are being treated at home, whether post-institutional or not, in order to enable them to escape the demoralising effects of ill-health combined with poverty. The use of shelters, it is advised, must be granted with discretion. A case is cited where, though visited periodically, the windows of the shelter were frequently found closed and a stove burning, even when the out-of-doors atmosphere was quite mild. This shelter is "stuffy," and less air is admitted than in an ordinary room with fireplace. In the rural districts, where the houses consist of a "but" and a "ben," the patient is usually found in the "but" or kitchen, which is frequently overheated, is used as a day-room, and in too many cases has not had the window opened for years. In such cases a course of institutional treatment is necessary from an educational point of view before a shelter can be of much advantage. The report notes the large number of "box-beds" still in use in the country, and it is a noticeable fact that the most advanced cases are often associated with insanitary or otherwise unsatisfactory dwellings. Dr. Rae notes the delay which very often occurs in seeking medical advice where early phthisis is present and where patients have unconsciously been spreading their disease.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 9, 1916.

Science and the National Service.

THE annual meeting of the British Association for the Advancement of Science has been held during the past week at Newcastle-on-Tyne, under the presidency of Sir ARTHUR EVANS, and, although the proceedings were less voluminous and in some ways less striking than usual, the work done has been valuable. Further, the holding of the meeting, as well as the words of some of the prominent speakers, form a proof that it is the intention of this country to develop our scientific resources in the national service. Sir ARTHUR EVANS is the Professor of Prehistoric Archæology at Oxford, and his presidential address dealt with the origins and forerunners of European civilisation, but although he invited his hearers to contemplate "a theme which, in the midst of Armageddon, draws our minds from present anxieties to that still passionless domain of the past which lies behind the limits even of historic controversies," there was much in what he said of the highest topical interest, especially in respect of the educational future of the country. With scientific intercourse broken up by the war and the cosmopolitan character of all research work obscured by the continental cataclysm, it will be a hard struggle for the friends of science and education in the days to follow, and Sir ARTHUR EVANS did not seem to expect that the ingrained distrust displayed by our rulers of all scientific advice will soon be remedied. We have more trust than has Sir ARTHUR EVANS in the development of national good sense. The meeting of the British Association at Newcastle was very much a business one, and the communications throughout had a practical bearing—facts which can hardly escape the intelligence of the public. And as the public insists more and more upon scientific guidance, more and more will the official classes see the necessity of obtaining scientific advice and providing facilities for scientific education. The circumstances in which the meeting of the British Association was held this year deprived the highly important section of general physics of its most obvious and topical subjects of debate, as it was impossible for speakers to detail in public the advances that have been made in many branches of engineering and aviation, the latest work having been entirely of a confidential nature. But the practical character of the programme was adhered to in all places where this could be done without reserve.

The First Annual Report has just been issued of the Committee of the Privy Council for Scientific and Industrial Research, and this valuable document in itself forms an answer to those who consider that the official apathy towards science can never be improved. The report bears out our view that at length science is coming into its own in this country; the forces that have been organised to attempt this consummation have well begun their task. And here the war has had its uses, for little doubt can be left in any minds as to the value and importance of applied science in war. The need now is to carry the conviction well home that applied science in peace is equally vital to the nation; and this can be best accomplished by inquiring, Where have we failed? For the war has taught us the lesson that we have failed in many important lines of industrial activity, or no special effort would now be needed to revise the situation. Our failures, in fact, form the real basis of the inquiry now begun by the Committee of the Privy Council and on many points the document is illuminating and in some ways full of reproach. The Committee, having for its advisory council Sir WILLIAM S. MCCORMICK (administrative chairman), Lord RAYLEIGH, Mr. G. T. BEILBY, Mr. WLLIAM DUDDELL, Professor BERTRAM HOPKINSON, Professor J. A. MCCLELLAND, and Mr. RICHARD THRELFALL, comprises standing committees of famous experts in engineering, metallurgy, and mining, so that its advice may be accepted with confidence. It opens our eyes to note a few examples from the report illustrating the directions in which we have been content to rely upon external supplies, when with ordinary intelligence and application we could have been quite independent of these supplies. We may well ask why it was that "in the early months of the war the great steel manufacturers were in grave danger from the possible exhaustion of the supply of chemical glass necessary for the testing of their materials and products," when the subsequent assistance of chemists led to the indication of "the detailed process of manufacturing a number of special glasses which were rapidly produced by progressive firms." The situation was saved, but why was the danger incurred? It is interesting to inquire, also, why it was that the great china and earthenware industries were "threatened with closure" when a consultation with the principal of a pottery school had the outcome that he "was able rapidly to supply the need and to manufacture sufficient cones for the whole pottery trade." Similar questions to those suggested by the report of the Committee of Scientific and Industrial Research may well be asked in regard to the preparation and manufacture of drugs and medicinals. Certain countries, of course, are favoured with vast natural resources. Germany, for instance, has a big potash reserve in its Stassfurt mines, the discovery of which soon gave them command of the potash market. Before this discovery our source of potassium was wood and vegetable ashes. These sources have been revived, but it is hardly possible that they can compete with foreign supplies, when the war is over, unless the Government will come to the aid of science. Events have shown that we can produce a whole series of modern medicinal products, examples of which are the synthetics, including the group of antipyretics, the organo-arsenic compounds, dyes, and so forth. We

possess, at all events, the raw essentials of these products in considerable quantities. We produce as much coal-tar as, if not more than, any other country, and, as is well known, this is the starting point not only of dyes but of many drugs of great importance in medicine. But the large production of synthetics, antiseptics, and dyes abroad has been the outcome of systematised research, and the country which has been pre-eminent in applying systematised research to industry is Germany, and her power and position have grown out of the attitude of the official classes, who have always paid the utmost respect to the potentialities of science. All inquiries and reflections show that in this direction our national neglect has been marked.

The first report of the Committee of Scientific and Industrial Research makes a practical start towards reform by recommending for immediate consideration the various branches of research which should receive State aid, and they are perfectly justified in pointing out that the conditions for success are, first, a largely increased supply of competent researchers, and, secondly, a hearty spirit of coöperation among all concerned—men of science, men of business, working men, professional and scientific societies, universities and technical colleges, local authorities, and Government departments. Neither condition will be effective without the other, and it remains to be seen how the spirit of research, as we have hitherto known it in this country, will be affected when the direction of research is dictated and aided by the State. The report says that "the universities can and must be the main sources of research in pure science the discoveries in which are at the root of all practical and technical application"; so that clearly the spirit of research which it suggests is quite opposed to German methods. For the factories in Germany are the centres of research, not the universities; and it is this fact which has rendered Germany so ingenious in much practical application of science. This country should pursue the two methods. It is the blend between the academic training of the university and lecture room with the clinical teaching in the ward that has produced for us our high standard of medical practice and medical research; similar training will produce the scientific advisers that we need, and should secure for them properly paid occupation.

The Treatment of Venereal Diseases.

WE agree fully with the view expressed at the last annual Representative Meeting of the British Medical Association, that it is essential to the satisfactory outcome of any schemes for the diagnosis and treatment of venereal diseases that the medical profession should be properly represented on all committees instituted to formulate these schemes. A circular was issued last week by the Local Government Board to local authorities commending a suggestion made by the Representative Meeting that the local medical profession should be represented at all local discussions on the machinery to be employed by county and municipal authorities for the repression and eradication of these diseases. This is surely the obvious way to secure the cordial coöperation of the medical profession; we go further than this, and say that unless medical representatives are present when concrete schemes of administrative and pathological work are proposed there will be a grave risk of the Government action in the matter proving of little value. Unless the medical men, who will in any event have to diagnose and treat venereal diseases, assist in the institution of the methods therefor, we may find that in the local schemes the proper facilities are not made available. Some county councils and some county boroughs are more enlightened than others, while some localities have better opportunities than others for setting on foot a real crusade against disease of any sort. It is essential that in every locality the services of the pathological laboratories of the area should be secured. Our universities, hospitals, and scientific centres are not arranged according to a pattern that has been decided either by density of population or by facilities of intercommunication, so that it will require sometimes considerable tact and skill to equalise among the whole the advantages enjoyed by some. Expert medical opinion would be very valuable on this point, which is definitely alluded to in the recommendations of the Royal Commission on Venereal Diseases. It was urged by the Commissioners that measures should be taken to render the best modern treatment of venereal disease readily available for the whole community, and only if medical men are present at the organising meetings to explain what are the best methods and to assist in the general arrangements, is it likely that persons affected by venereal disease will take advantage without hesitation of the chances of treatment afforded.

The work of the Royal Commission on Venereal Diseases received remarkable endorsement in the minds of all thinking persons as soon as the report was issued, and the recommendations of the Commission, as we know, have been largely adopted by the Government. At this moment the issue by the National Council for Combating Venereal Diseases of a synopsis of the report, made by Captain DOUGLAS WHITE, is very opportune. Lord SYDENHAM, the chairman of the Commission, in a statement prefatory to the synopsis, expresses his hope that it will provide a convenient compendium of the whole subject of venereal disease as elucidated by the inquiry of the Commission, and we think it will exactly serve the purpose thus indicated. Captain WHITE has made his synopsis in the right way. It is, as he says, "nothing but a shortened report," for he has effected the reduction by systematic abbreviations and not by wholesale omissions, while the statements dealing with the economic effects of venereal diseases are given in full, and the summary of recommendations is included verbatim. By means of this volume the contents of the report, its scope, limitations, and conclusions will become intelligible to

those in charge of the local schemes; indeed, it should serve as a handbook to such deliberations. With the presence of medical men to explain technical points and to elucidate pathology, there should be no great difficulty in understanding exactly the advice given by the Commission, and in appreciating the arguments which have led to the expression of the various opinions. Local committees, armed in this way with information as to what to aim at and what to avoid, should be in a favourable position to secure methods of treatment both properly directed, and devised so as to secure the minimum of inconvenience and of undesirable publicity to the patients. In this way success must follow the national endeavour to minimise the evils of venereal diseases, and we may find ourselves, sooner than we have hitherto dared to hope, looking forward confidently to their eradication.

At the first annual meeting of the National Council for Combating Venereal Diseases, held in June last, Dr. FREDERICK TAYLOR, the President of the Royal College of Physicians of London, who is the chairman of the Medical Committee of the National Council, explained in a few words the attitude of the medical profession towards this enormously important campaign, and his views have received general endorsement. Alluding to the work of the Medical Committee of the National Council which has for one of its objects an inquiry into medical education in relation to venereal diseases, Dr. FREDERICK TAYLOR pointed out that medical education is the lifelong occupation of medical men, who always remain students of disease. But he suggested that, in regard to venereal diseases, medical education could be more actively conducted, alluding to the fact that circumstances had conspired to produce in the clinical schools a shortage of material upon which instruction in venereal diseases could be based. The observation is very just. It is well known that at certain of our general hospitals the wards reserved for cases of venereal diseases have been closed, while it is an unfortunate fact that at some institutions a narrow idea has prevailed that venereal diseases ought not to be treated at the expense of the charitable public. The result of this piece of mediævalism has been that while excellent research has been carried on at the hospitals into the later manifestations of venereal diseases, the patients having secured entrance for the treatment of terribly damaging sequelæ, attention has been much withheld from early cases. This is a position of affairs which must be removed. We have now methods of treatment available whose arresting effects are remarkable. There is not an exact consensus of opinion about all the details of these methods—the fact that we do not pride ourselves at having arrived at finality within a few years of the initial discovery is thoroughly hopeful from a scientific point of view—but we know that recently weapons have been placed in our hands which should be used at once on early cases everywhere, including the general hospitals and all institutions for the treatment of the sick. When this is done, students will grow up well informed not only in the pathology and the literature of venereal diseases, but also in the technique for their relief in the early and curable stages. While the medical education of the students would thus be provided for, that of the general practitioner should be insured by his receiving every facility for attending the out-patient and in-patient practice at all centres of treatment, and by his being in the position to ensure his patient's access to institutional treatment when he considers that course desirable.

Annotations.

"Ne quid nimis."

TRENCH WARFARE AND THE RENAL FUNCTION.

WE publish in another column some interesting observations by Captain J. W. McLeod and Médecin-aide-Major P. Ameuille on the effect of trench warfare on renal function, which aim at throwing light on the outbreak of nephritis among our troops in France. It is useful to have these observations on the urine of healthy soldiers as a basis for comparison. They believe the occurrence of symptomless albuminuria is the result of fatigue. This is probable; Dr. William Collier discovered albumin in the urine of every one of the Oxford crew of 1906 after rowing a course, while it was even more pronounced in the case of men after running a race. Captain McLeod and Major Ameuille found that this symptomless albuminuria was more prevalent among the troops undergoing training in England who were habitually carrying out physical exercises. Yet, as they observe, nephritis is not prevalent among these, or, indeed, among recruits at any time, so that some other factor must be sought for the outbreak among the troops in France. The number of men who developed nephritis subsequently to a negative examination for albumin was exactly the same as of those who developed nephritis after a positive observation. The authors admit the probability, but not the certainty, that acute nephritis is due to a sudden change in a healthy kidney. They do not consider exposure the cause of the change. They conclude that diet is the most likely explanation of the excess of transitory albuminuria and mild nephritis, and that it may contribute towards the development of the more severe cases. The chief factors they hold responsible in the diet are excess of protein combined with lack of fresh vegetables. Yet, as Mackenzie Wallis showed, the chemical evidence is against the existence of an intestinal toxæmia, which might in that case have been anticipated. It would be important to know whether similar dietetic conditions obtained in the American Civil War, the only other campaign in which nephritis assumed epidemic proportions. It would also be useful to know whether the rations of our troops while training in this country differ widely from those which they get while fighting in France, for otherwise it is difficult to see why nephritis should be rare under the former conditions and common under the latter. The authors appear to consider that transitory albuminuria shades off into mild nephritis, though this is not in accord with Dukes's observations on the albuminuria of boys at Rugby

School. He found it even more commonly in them than the authors found it among troops undergoing training, 16 per cent. as against 10 per cent. Yet only once did he subsequently find albumin in these cases in later life, and that was in a boy who had left school less than a year. This suggests that symptomless albuminuria is quite distinct from mild nephritis. If dietetic factors are responsible for the greater incidence among the British troops than the French, it is difficult to explain the increase in the cases among the French in the autumn of 1915, whereas the gradual spread of an infective agent from the British to the French lines would account for this. Cases of nephritis are now becoming much less frequent among our troops; in other words, the incidence rose and is falling again in just the same way as was seen in the American Civil War, where the outbreak was at its height for about 12 months, and where the case-incidence rose earlier and reached a higher level in the armies of the Central Region than in the rest of the Army, just as the British Army was affected sooner and more severely than the French. These careful observations from an independent standpoint might be held to strengthen Langdon Brown and Mackenzie Wallis's theory of an infective origin, since the necessity for some other factor is admitted. It is true that this theory cannot be proved until an infective agent is found, though scarlet fever and measles still lack this proof, to mention only two admittedly infective fevers. At the same time, some weight must be given to Mackenzie Wallis's experimental results. He found that the urine of these nephritic patients after being filtered through a Berkefeld filter produced an illness in monkeys and rabbits eight days later. If the urine had been previously heated to 55° C. this did not occur. It is true that only one of the animals developed albuminuria, but the eight days' interval excludes a merely toxic cause and corresponds to the incubation period suggested by the cases where symptoms have developed during leave in this country. Observations are welcome on any of the aspects of this mysterious outbreak. One point on which accurate information is desirable may be mentioned —whether the impression is correct that since this outbreak in France unexplained cases of acute nephritis are becoming more common in this country?

ECONOMY AND PUBLIC HEALTH.

EXHORTATIONS to economy in such matters as water, gas, and electric lighting, to which we referred last week, are in general very little heeded; the public is too ready to disregard waste in this side of their domestic affairs. But this same public is usually alert enough when increased prices for such things as comestibles are forced upon them. In consequence there has been some shrill complaining about the price of food, and while some of the outcry has been justifiable, some has not been so. The shortage of sugar is at the present moment a more acute matter than anything else, and the supplies of this commodity are completely under the control of the Government. Those who clamour for every article of food to be brought under similar control may well bear this in mind. There is a combination of circumstances which is making food dear in a way that could not be effected by any form of cornering, greedy or criminal. Paramount causes are the shortage of shipping and labour, the high price of fuel, the partial failure of the American wheat crop, and all the contingencies impossible to control in the face of the greatest war that the world has ever seen. Where there seems to be evidence of the holding up of prices unduly against the public we trust that stern measures will be taken. With respect to sugar, the shortness of which threatens the waste of a bountiful fruit harvest this year, many suggestions have been made for conserving the fruit in other ways. Quite good jam can be made with glucose, and this substitute is a substantial food, but unfortunately we depend for our supplies chiefly upon America, this country never yet having approached seriously the questions of either converting its starch productions into glucose or of cultivating the beetroot. At the present time glucose, having regard to its relatively low sweetening and preserving power, is not, weight for weight, much cheaper than ordinary sugar. More attention might with advantage be given to some process of desiccation which would effectively preserve the fruit until the time arrived when the sugar shortage was relieved. Generally speaking, although the position in regard to the scarcity and dearness of food is trying, it is by no means serious, and all apprehension of a famine or famine prices may be dismissed from our minds. Moreover, so far we are not able to connect any breaking down of the public health with what are undoubted hardships.

THE TRANSPLANTATION OF DUCTLESS GLANDS.

RECENT knowledge of the internal secretions shows the importance of the problem of the transplantation of the ductless glands. In the *Journal of the American Medical Association* of July 22nd Dr. O. T. Manley and Dr. D. Marine have reported an interesting series of experiments on rabbits made in the past three years. After removal of both ovaries ovarian tissue was transplanted into the subcutaneous tissue of the abdomen of the same animal in nine cases (autotransplantation). In all the stroma, interstitial cells, and Graafian follicles showed survival and growth over periods varying from 34 to 210 days. Mature Graafian follicles were found in two of the rabbits associated with hyperæmia of the uterus and the typical phenomena of rut. In the older grafts hæmorrhagic cysts formed because the ripened follicles "ruptured into themselves" instead of on a free surface, as occurs normally. Apart from this complication the grafts showed all the signs of normal functional activity. Autotransplantation of thyroid tissue was invariably successful. Removal of the thyroid gland caused compensatory hypertrophy of the transplants, as has been previously recorded by Christiani and von Eiselsberg. Any thyroid gland left underwent the same hypertrophy and involution as the transplants, and both took up in the same manner and retained iodine administered. This negatives the view of some observers that specific nerves are necessary for the growth or functional activity of the thyroid gland. Parathyroid tissue accidentally transplanted with thyroid was found active-looking and normal when examined microscopically. On the other hand, when autotransplantation of the spleen was performed the tissue was always absorbed in 12 days. Homotransplantation was much less successful than autotransplantation. Of 26 transplantations of ovarian tissue complete absorption of the grafts took place in all but one, except for the interstitial

and luteal cells. Evidently the tissues of the host reacted only feebly to these cells, while they reacted strongly to the cells of the Graafian follicles. Homotransplantation of the thyroid was usually followed by complete absorption from the tenth to the thirteenth day. Repeated homotransplantation accelerated the destruction of the graft, showing that it developed the reaction to the grafts. On the other hand, in two rabbits homografts persisted for more than a year and in every way resembled autografts. Between these extremes there were all grades of destruction. These differences seem to depend on the development of an immunity reaction to a "foreign" protein (tissue). Experiments in tumour transplantation have shown that degree of "foreignness" is the most important factor in such reaction. The practical lesson for the surgeon seems to be that while the autotransplantation of the ductless glands is hopeful, little can be expected from transplantation from other subjects.

THE CURTAILMENT OF THE DUTIES OF THE CERTIFYING SURGEON.

IT has been announced officially from the Factory Department of the Home Office that on and after Sept. 4th it will no longer be necessary for the occupier to notify any accident to the certifying surgeon (Section 8 of the Police, Factories, &c. (Miscellaneous Provisions) Act, 1916). Accidents must, however, be notified as before to the district inspector of factories and entered in the general register. The certifying surgeon may be required by the inspector to investigate and report upon certain accidents, and for this purpose will have the same powers as in the past. The departmental instructions have been modified accordingly. Notice of every case of lead, phosphorus, arsenical, or mercurial poisoning, or anthrax occurring in a factory or workshop must still be sent to the certifying surgeon as well as to the inspector, and this requirement now applies also to cases of toxic jaundice—that is, jaundice due to tetrachlorethane or nitro- or amido-derivatives of benzene or other poisonous substance.

JOHN BENJAMIN MURPHY.

WITH the death of Dr. John B. Murphy, at the early age of 59, general surgery has lost one of its ablest exponents. Murphy had been for more than 20 years professor of clinical surgery in the Northwestern University at Chicago, and he was also chief surgeon of the Murphy Hospital, St. Joseph's Hospital, and the Columbus Hospital in the same city. His name is associated with a large number of useful surgical inventions, of which the best known is the Murphy button, which he devised very early in his career. It was in 1893 that he reported to the New York Academy of Medicine a series of 22 cases of cholecystenterostomy in non-malignant disease all of whom recovered. He later published in THE LANCET an important paper setting out the significance of his observations. The Murphy button continued for a decade or more to hold the field unchallenged in intestinal anastomosis, and an oval form of it was still used by its originator up to the time of his death. Independently of Forlanini, Murphy made the suggestion of injecting nitrogen into the pleural cavity in cases of hopeless unilateral disease of the lung, and although this suggestion did not meet with much acceptance at the time, it has been fully justified by recent experience. Murphy himself had recently gone so far as to apply the treatment even in incipient cases of pulmonary tuberculosis. Other methods with which the name of Murphy is associated are the treatment of peritonitis by posture and continuous rectal infusion, the union of severed blood-vessels by intussusception and suture, the extra-articular wiring of fractures of the olecranon, and a series of differential signs in the diagnosis of lesions in the right abdominal cavity. In American surgical practice his "fist percussion," "hammer-stroke percussion," "deep-grip palpation," and "piano percussion" are well known terms. Murphy was an excellent teacher with a full knowledge of his subject and a great power of imparting it to others. Four years ago appeared the first of a bi-monthly series of Clinics containing the essentials of his surgical practice and appealing to practitioners the world over. As a surgeon one of his most daring feats was the successful removal of an embolus from the common iliac artery with restoration of the circulation. Murphy's presence was well known at foreign medical associations. To the surgical section of the British Medical Association in 1906 he made a useful contribution to the discussion on the surgical treatment of duodenal ulcer introduced by W. J. Mayo. At the Canadian Medical Association in 1910 he demonstrated his method of aspirating infected joints, and two years ago in London he gave an account of his method of interposing a flap of soft tissue between the articular surfaces of an ankylosed joint. Honours of all kinds were his share. He was LL.D. of his own university and honorary Fellow of the Royal College of Surgeons of England. Murphy was international in the best sense.

THE NATURE AND MANNER OF CONVEYANCE OF INFANTILE PARALYSIS.

THE epidemic of infantile paralysis in New York has rendered the disease of special interest at the present time. Considerable advances have recently been made in our knowledge of its pathology and mode of conveyance. These have been well summarised in an address given to the New York Academy of Medicine by Dr. Simon Flexner, director of the Rockefeller Institute. It may be remembered that the most important advance, the discovery of the microbe of the disease, was made in 1913 by Dr. Flexner in conjunction with the Japanese bacteriologist, Noguchi. They showed that infantile paralysis is due to the invasion of the spinal cord and brain by a globular organism so minute that it is filtrable; yet it is distinctly visible under the highest powers of the microscope. In the subjects of the disease the virus is found constantly on the mucous membrane of the throat, nose, and intestines, and less frequently in other internal organs, but it has not been found in the blood. The difficulties attending its cultivation and identification are so great that ordinary bacteriological tests for its identification are futile, but it can be detected by inoculation of monkeys (which develop a disease corresponding to infantile paralysis). By this test it has been shown that the mucous membrane of the nose and throat of healthy persons who have been in intimate contact with acute cases of infantile paralysis may become contaminated with the virus without contracting the disease and may convey the infection to others, principally children,

who develop the disease. It has been found that the virus leaves the infected body in the secretions of the nose, throat, and intestines. It leaves contaminated healthy persons in the secretions of the nose and throat. It was at one time believed that biting insects, particularly the stable fly, might convey the virus from the blood of infected persons to others, but as the virus has not been detected in the blood, and later experiments with the stable fly have not confirmed the earlier ones, this view is discredited. The virus enters the body as a rule, if not exclusively, by the mucous membrane of the nose and throat. It multiplies there, and then penetrates to the brain and cord by the lymphatics connecting the nasal mucous membrane with the interior of the skull. The virus is readily conveyed to the nose and throat from infected persons by coughing, sneezing, kissing, and by fingers and articles contaminated with oral secretions, as well as the intestinal discharges. As the virus is thrown off from the body mingled with the secretions it withstands for a long time even the highest summer temperatures and complete drying, whilst it retains its virulence when glycerinated. Thus infection may be conveyed by dust arising from the dried secretions. The survival of the virus in the secretions is favoured by weak daylight and darkness, but it is readily destroyed by sunlight. The virus may survive for a long time in the throat; in one case it was detected seven months after the onset of the disease.

MIDWIVES AND ANTE-NATAL CARE.

THE desire to diminish the effect of the ravages of war upon the population of the United Kingdom is likely to concentrate public attention for many years to come upon the birth-rate and upon the death-rate among infants. The introduction of reforms will arrive, which but for the war might have been condemned to a slower process of development. In particular, ante-natal care of mothers, and the consideration as potential mothers of young girls are likely to receive closer and more general consideration in the near future. In a lecture recently delivered before the Gloucester City and County Midwives Association by Miss L. G. Rogers, an inspector of midwives, stress was laid upon the necessity for providing ante-natal care through the medium of midwives, if it were desired to render it general and effective. The midwife, it was declared, was in a better position than anybody else to influence the mother, without whose goodwill and coöperation no satisfactory result can be achieved. In this connexion the lecturer claimed that the provision of ante-natal care must receive due consideration from the Central Midwives Board, and also that the remuneration of midwives must be increased. This latter condition would no doubt have two results. Prospects of a better livelihood would attract a higher class of women to the work, and would also increase the number of candidates for qualification. Such an increase is highly desirable, because there are not too many midwives in practice, and to impose extra work in the shape of increased attention to the requirements of the mother before birth would only be possible in the case of women whose time was not already filled up. In any event increased duties without recognition of the need for increased fees would convert ante-natal care into charitable work at the midwife's expense. On the whole, we are in accord with the suggestions made. We do not see any reason why the training of midwives to advise pregnant women as to the requirements of their condition, or the attraction of well-educated and intelligent women into the midwife's profession, should cause any trespass upon the domain rightly reserved for the medical practitioner. On the other hand, however, the question of remuneration must be solved with due consideration for the ability of patients to pay more in those classes for whose benefit the certified midwife has been brought into existence. The trade of the "handy-woman" is not yet stamped out in some places, and any raising of the fees of her qualified competitors would increase her *clientèle*. The conditions asked for by the lecturer referred to do not, therefore, seem likely to be realised without legislative intervention.

PLAGUE IN ENGLAND.

THE occurrence of three cases of plague at Bristol and two at Hull has revived interest in the disease among medical men in this country. The recrudescence of the malady in modern times is one of the most interesting facts in the history of epidemiology. Our seaport towns are, of course, peculiarly liable to attack owing to the close and constant intercommunication by shipping with infected countries such as India and Egypt. As is well known, the rat is the carrier of the disease and the transmitter to man is the rat flea. There is no doubt that a chronic form of plague among these rodents occasionally exists in ports which have been long infected by the disease. The migratory habits of rats are responsible for the conveyance of plague infection over long distances by sea. This danger is more threatening where grain cargoes are carried and where plague-infected rats from such ships are likely to come ashore at the ports of arrival. So far as we are aware, the circumstances associated with the cases at Bristol and Hull are such as to suggest that the plague infection was probably ship-borne. Another suggestion is that rats were purposely inoculated with plague by German agents and let loose in Bristol with the sinister design of creating an outbreak of plague in Britain. But the evidence on which this hypothesis is based has not been made public, and judging from the published statements there does not seem anything to support it.

CLEAN MILK RECOMMENDATIONS.

TWO years ago we commented[1] with satisfaction on the passing of the Milk and Dairies Act, 1914, and expressed the opinion that the Act if properly administered should do much to promote the public health. The administration of the Act was to be primarily in the form of Orders to be issued by the Local Government Board. At a conference held recently at the instance of the National Clean Milk Society resolutions were drawn up and forwarded to the Board with the request that they should be issued as Orders under the Act. The Society of Medical Officers of Health was represented at the conference by its President, Dr. F. J. Allan, the Sanitary Inspectors' Association by Mr. J. T. Quinton, and the medical officer of health for Ealing, Dr. Thomas Orr, was also present. The conference made recommendations regarding the lighting and ventilation of cowsheds, the removal

[1] THE LANCET, May 23rd (p. 1474) and August 22nd (p. 512), 1914.

of manure, and the provision of ample supply of boiling water or steam to every dairy. It was suggested that in shops used for the sale of milk nothing but milk, dairy products, and eggs should be sold other than for consumption on the premises; that special provisions for the cooling and transit of milk should be made; and that the addition of any colouring matter should be prohibited, as well as the sale of milk containing more than 40 parts of sediment per million. An important recommendation was made to reserve the designation of "certified milk" for raw milk produced and distributed under the following conditions:—

1. That the whole herd at the dairy from which the milk is produced should be shown to be free from tuberculosis by the periodical use of the tuberculin test, and should be examined each month by a veterinary surgeon.
2. That the premises should be inspected once a month by the medical officer of health, the inspector of nuisances, or other person specially qualified, and that the employees of the dairyman should be under the constant supervision of such officers.
3. That all samples of milk taken to determine the bacteriological or chemical content should be taken either at the point of distribution by the retailer or of delivery to the consumer.
4. That the bacteriological content of the milk should not exceed 10,000 per cubic centimetre at the time of delivery to the consumer.
5. That all "certified milk" should be bottled in bottles of imperial measure on the farm where it is produced, and that such bottles should have labels on which should be stated: (*a*) The name of the farm where it is produced; (*b*) the name of the certifying authority; (*c*) the date and time of milking.
6. That the certificate to be granted for permission of the sale of certified milk can be cancelled at any time by the certifying authorities.

Finally, the Local Government Board was recommended to prepare general directions for producing and distributing milk which it should be the duty of the dairyman to exhibit in every cowshed and dairy. These regulations, if carried into effect, should go far to achieve the admirable aims of the Clean Milk Society, which are to raise the hygienic standard of milk and milk products and to educate the public as to the importance of a clean and wholesome milk-supply.

SCLEREMA ADIPOSUM IN INFANTS.

THE resistance of newly born children to bacterial infections of all sorts is low, and infections which in adults would probably remain local are apt in infants to become generalised infections of the blood. Having become generalised, such an infection may manifest itself in very various clinical forms that are quite unlike the septicæmia or pyæmia of adults. In some instances hæmoglobinuria with jaundice and cyanosis is the outstanding feature; occurring in epidemics, this is known as Winckel's, or more properly Charrin's, disease. In other cases extensive fatty degeneration of the heart and abdominal viscera, with a tendency to hæmorrhages, is the chief characteristic, and the infection is known as Buhl's disease. In other instances the main phenomenon due to the bacteriæmia has been general sclerema, pemphigus, melæna, the hæmorrhagic diathesis or a tendency to spontaneous hæmorrhages, or purpura, and the disorder has been named accordingly. Bacteria of many varieties have been cultivated from the blood or viscera of infants dying of these different but highly fatal diseases, including staphylococci, streptococci, Friedländer's bacillus, a bacillus like that of diphtheria, B. coli, B. paratyphosus, B. pyocyaneus, B. aerogenes lactis, and special bacteria such as the B. hæmorrhagicus of Kolb and Babes, or the B. melænæ neonatorum of Gärtner. In some instances the blood infection has been found to be due to two or three of the above-mentioned bacteria together. Dr. O. H. Forssell has recently published[1] two cases of sclerema adiposum in newly born infants, in which he attributes the condition to a proved infection of the blood with staphylococcus pyogenes aureus and albus, the former being the chief pathological agent. In each case B. coli was grown in the cultures taken from one or other of the viscera, possibly, as Dr. Forssell suggests, as a contamination. He believes the infection with the staphylococci took place in utero in both the instances of sclerema he now describes; as, indeed, was the case in another example of the disease recorded by himself in 1913. As he points out, very various views have been held at different times as to the etiology of the disease known as sclerema neonatorum or sclerema adiposum. Thus, Langer (1881) attributed it to a low body temperature; D'Agata (1887) to a vasomotor and trophic neurosis of the vagus; Somma (1892) to a neurosis of the nervous centres for the regulation of the temperature of the body; Namias (1885) to incomplete expansion of the lungs; Comba explained it as the result of a change in the arterial walls due to a bacterial infection of the blood; Schmidt (1895) and also Gallarand (1908) showed that it was a form of septicæmia, while Mensi (1913) added thereto an additional factor in the form of an assumed defective secretory activity on the part of the thyroid gland. As various writers have done before him, Dr. Forssell comments on the clinically and bacteriologically protean character of the septicæmias occurring in the fœtus and newly born infant; it is clear that the classification of these infections stands in need of revision and extension.

DURING the past week H.R.H. Princess Christian has made a number of visits to hospitals and other institutions in the Edinburgh district. Amongst those she visited were Lady Elphinstone's Hospital for Discharged Soldiers at Musselburgh, the Royal Victoria Hospital, and No. 2 Scottish General Hospital, Craigleith, being received by Surgeon-General Culling.

King Ferdinand of Rumania has sent a telegram accepting the offer of Lord Lonsdale, on behalf of the British Sportsmen's Ambulance Fund, to supply five fully equipped motor ambulances.

Captain G. Herbert Clark, R.A.M.C., who has been appointed chemical adviser to the London District and commandant of the London Anti-Gas School for Troops, is Weir Research Assistant in Materia Medica at Glasgow University.

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[1] Nordiskt Med. Arkiv, Stockholm, 1916, Inre Medicin, xlix., h. 2, 1.

THE LATE DR. WILLIAM STEWART, OF PARAGUAY.—The death is announced at his home in Urchin, Paraguay, of William Stewart, M.D. Aberd. (1852), in his eighty-sixth year. Educated in London, Perth, and Edinburgh, he became qualified in time to serve as a surgeon at Scutari during the Crimean War, and ten years later was surgeon-general to the Paraguayan army. In the interval he had been private secretary to President Carlos Lupez, and is stated by *La Nación* to have exercised considerable influence on Lupez during his dictatorship. In 1869 he returned to Edinburgh and studied there the antiseptic technique under Lister, introducing it on his return to Paraguay at Asuncion, which was, he thinks, the second place in the world to adopt Listerism. Dr. Stewart was for many years H.B.M. Consul in Paraguay.

THE SHIAH PILGRIMAGE AND THE SANITARY DEFENCES OF MESOPOTAMIA AND THE TURCO-PERSIAN FRONTIER.

BY F. G. CLEMOW, M.D. EDIN., C.M.G.,
BRITISH DELEGATE TO THE INTERNATIONAL BOARD OF HEALTH AND PHYSICIAN TO H.M. EMBASSY, CONSTANTINOPLE.

IV.—THE PILGRIMAGE AND TRANSPORT OF BODIES TO THE SHIAH HOLY PLACES—(*concluded*).

THE great cemetery at Nejef extends into the desert on the north and east sides of the town. The tombs cover an area of about 2400 metres in length and 800 metres in width. This area is not surrounded by any wall or railing, and each year it tends to stretch farther and farther into the desert. It contains many thousands of tombs, a number of which are merely mounds of earth, while others have a small brick or stone cupola over them, and still others take the form of small mosques, richly ornamented with coloured tiles and with inscriptions in Persian or Arabic. Not a few of these larger tombs are built in the middle of an enclosed garden, and occasionally a house will be seen in the same enclosure, in which the relatives of the deceased may spend the day, or even several days.

The burial taxes have already been mentioned. They are called the *defnieh* or *turrabieh* taxes. The right to collect them has usually been conceded by the Evkaf (or Ministry of Pious Foundations in Constantinople) to some private person. In 1914 the concessionnaire was a Jewish inhabitant of Bagdad, who had paid the sum of £T.13,000 (£11,700 sterling) for a concession lasting three years, and covering interments both at Kerbela and Nejef. His predecessor had paid £T.22,000 (£19,800) for a concession, also of three years, but at that time the bodies of Turkish subjects were not exempted from the taxes, as they were later.

For burial in the Nejef cemetery, whether of fresh or dry bodies, the *defnieh* tax was 50 piastres (8*s.* 4*d.*), with an additional sum of 10 piastres, the proceeds of which were destined for the construction of a hospital in the town. At Kerbela the tax was only 30 piastres (5*s.*), plus the hospital tax of 10 piastres. At the latter town a fairly good hospital had already been built with the proceeds of the tax, but at Nejef no hospital had been built up to the year 1914.

Burial in the precincts of the mosques is naturally much more costly than in the cemetery, and the charge varies according to the position of the tomb. Annexed is the ground plan of the great mosque of Nejef, in which the various portions of the precincts are shown. In the centre is the reputed tomb of Ali, the first Imam, around which is the enclosure known as the *Hadra*; there are no tombs here. Surrounding this again is the space known as the *Revak-i-Sherif*, or inner court of the mosque, which is regarded as the most sacred portion for Shiah burials. Around this is the *Sahn-i-Sherif*, or great outer court of the mosque, which in its turn is surrounded by walls, against which are a series of arched recesses and chambers, similar to those found in a Persian caravanserai; these are known as the *Aivan vé Oda*. Finally, at one extremity of the *Revak-i-Sherif* is a space known as the *Tarma* or *Revak-Tarmassi*. In all these divisions the ground is covered with large paving-stones, under which are the *serdabs*, or excavations in which the bodies are deposited.

The *Revak-i-Sherif* at Nejef contains, it is said, about 100 serdabs. The charge for interment here is £T.60 (£54), and consequently the number of burials here is small. The *haffar bashi*, or head grave-digger, informed me that only four persons had been buried here in the preceding five years. At Kerbela the charge for burial in this part of the mosque is only £T.12½ (about £11).

The *Sahn-i-Sherif* of Nejef contains from 500 to 800 serdabs (the exact number could not be ascertained). They are smaller than in the Revak-i-Sherif, but they are deep, and each can receive from nine to ten bodies. The charge for burial here is from 200 to 250 piastres (£1 13*s.* 4*d.* to £2 1*s.* 8*d.*). The number of burials in the Sahn-i-Sherif of Nejef is from 200 to 300 yearly. At Kerbela the charge for burial in this part of the mosque is only £T.1 (18*s.*).

The *Aivan vé Oda*, or arched recesses and chambers, number 14 on each side of the court and one in each corner, or 60 in all. Each contains from four to ten serdabs, and each serdab can receive 10, 15, or 20 bodies. The charge for interment here varies between 250 and 500 piastres (£2 1*s.* 8*d.* and £4 3*s.* 4*d.*), and sometimes it is as dear as 1000 or 1200 piastres (£8 to £10). At Kerbela this charge is reduced to £T.1½ (£1 7*s.*).

Finally, the *Tarma*, or *Revak-Tarmassi*, contains only some 15 or 20 serdabs, but they are of great size, and can receive from 20 to 50 bodies each. The charge for burial here is 500 piastres (£4 3*s.* 4*d.*) at Nejef, and £T.3 (£2 14*s.*) at Kerbela.

The *serdabs* are, as just stated, covered over with paving stones. They are mere unlined excavations in the soil in which the bodies or packets of bones are deposited without coffins or other wrappings. They are rarely buried in the earth at the bottom of the serdab, save at Samara, where such true interment is said to be common.

The registration of burials was found to be very imperfect, and the following figures, furnished by the health offices of Nejef and Kerbela, are probably much below the truth.

Interments at Nejef.

1910	9,259	1912	14,114
1911	11,363	1913	15,083*

* In 10 months only.

No separate figures were available at Nejef for burials in the cemetery and the mosque precincts respectively.

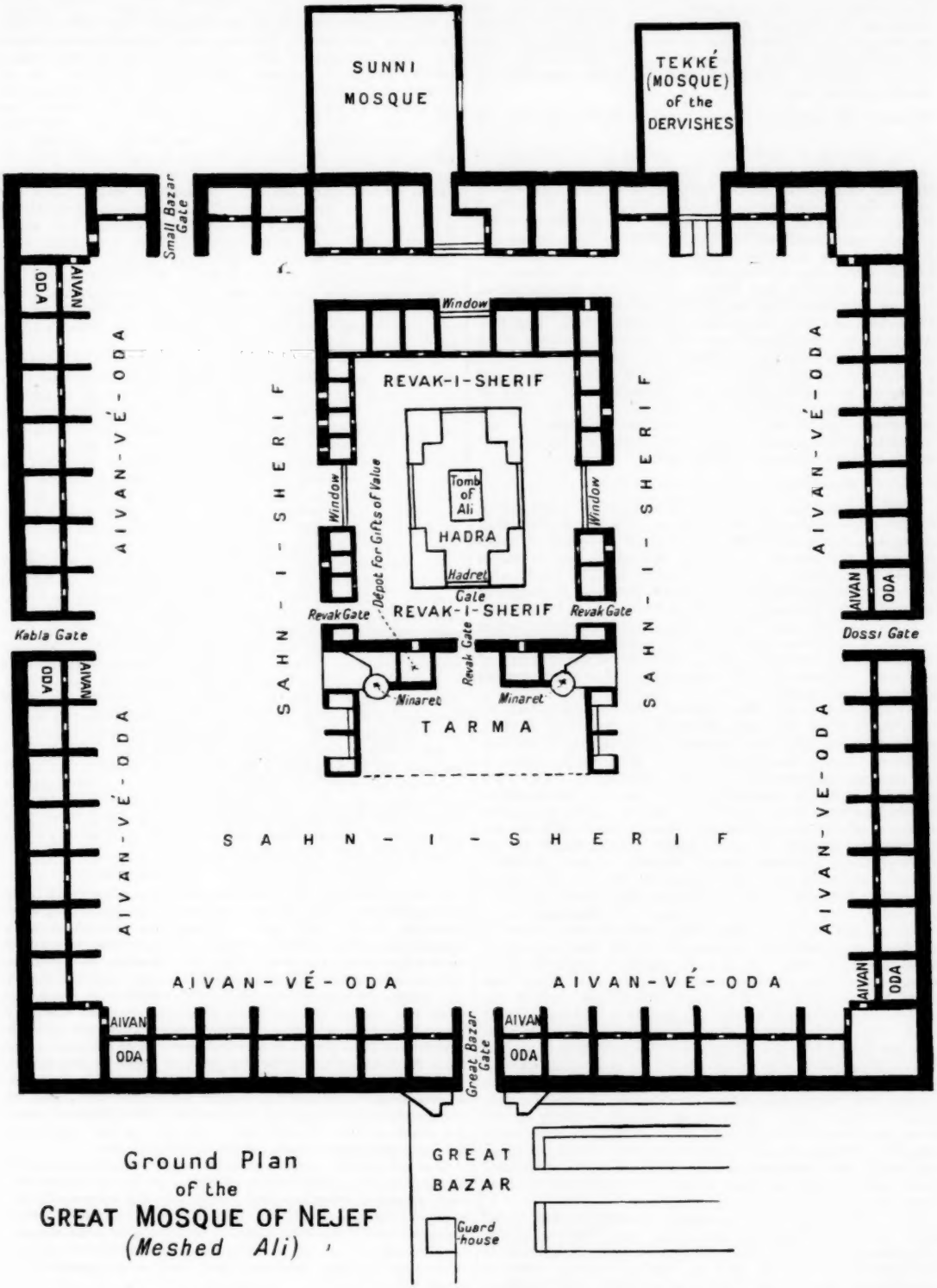
Interments at Kerbela.

—	In the mosque precincts.		In the cemetery.		Totals.		
	Fresh.	Dry.	Fresh.	Dry.	Fresh.	Dry.	Totals.
1908–09 ...	327	8	2361	1873	2688	1881	4569
1909–10 ...	323	11	2121	2820	2444	2831	5275
1910–11 ...	371	14	1490	1013	1861	1027	2888
1911–12 ...	491	10	1429	2321	1920	2331	4251
1912–13 ...	528	16	1949	2034	2477	2050	4527
Averages	408	12	1870	2012	2278	2024	4302

It is clear that in the course of a thousand years all the mosque serdabs must have been filled, probably many times over. It is true that a human body, even if buried freshly, becomes in the course of years reduced to a relatively small volume; but it is no less true that it requires an immensely long period for a body to disappear altogether. If it be supposed that there are at Nejef 1000 serdabs, each capable of holding from 10 to 12 bodies, or a total of 10,000 to 12,000 bodies in all; and if it further be supposed that only 400 interments take place here each year (at Nejef the number is certainly much greater), it is evident that all the serdabs must be filled in from 25 to 30 years. If, finally, this period be tripled or quadrupled the conclusion is inevitable that at least once in a hundred years all the serdabs must be completely filled. And, as this process has been going on for about ten centuries, it is certain that from time to time the dust and fragments of bones must be removed from the serdabs and disposed of elsewhere.

It had been asserted that these remains are removed at intervals and burnt in the stoves which heat the *hamams*, or public baths, of the holy cities. There is no proof, however, that this is a general practice, though it may be done occasionally. For it seems to be a fact that when some years ago foundations for new houses were being dug on the square known as the *Khaimagah* in Kerbela (the traditional spot where Hussein lost his life), a large quantity of bones were disinterred, and actually were burnt in the bath furnaces. It is also stated that the mosque serdabs at Kerbela are emptied from time to time and their contents deposited in the desert outside the town

It is unquestionable that the depositing of these thousands of bodies, fresh and dry, in the mosque serdabs has caused the land of the whole mosque area to be impregnated with the organic matter derived from them. It is also certain that the paving stones over them are by no means hermetically sealed, and the gases and odours from the tombs escape freely into the air of the precincts. Many of the officials and residents in the holy cities were unanimous in testifying to this fact, and in stating that, particularly in summer, the odour in the mosque courts is so



Ground Plan of the GREAT MOSQUE OF NEJEF (*Meshed Ali*)

Note.—This plan of the Great Mosque of Nejef was procured for the author by a friendly Shiah. No previous plan of these Shiah shrines appears to have been published, and since they can never be seen by European eyes the plan may claim to have more than a passing interest, which will be enhanced by the fact, recently announced, that the Turks have already shelled the mosque of Hussein at Kerbela.

overwhelming that it is impossible to remain there for more than a few minutes at a time. The conditions are still worse at Kerbela than at Nejef, as the former city is built on the plain, but little raised above the sea level; the land is consequently often waterlogged, and all serdabs of a certain depth are inundated, and the bodies may be seen floating in the water.

Sanitary Measures hitherto in Force in Connexion with the Pilgrimage.

The defence of these regions against the importation of infectious disease by pilgrims and dead bodies was (before the war) carried out by the members of the sanitary service under the Constantinople Board of Health. The nature of these defences at Basra and on the Persian frontier has already been described. In the interior of Mesopotamia and Irak-Arabi the organisation was as follows. The principal health office was at Bagdad. Health offices existed at Kiazimein, Kerbela, and Nejef; at Bugheila, Amara, Ali-el-Gharbi, and Gourna, on the Tigris; and at Musseyib, Kufa, Shenafieh, and Samawa, on the Euphrates or its branches. At all these offices there were one or more sanitary clerks and guards (mounted or on foot); one only, that of Nejef, possessed a medical officer. The main use of these offices was to report to Constantinople the appearance of plague or cholera in their district, to examine the papers of pilgrims or corpses, to collect the sanitary dues, to see that the regulations for the transport of bodies were complied with, and to prevent "sanitary contraband."

Regulations for the Transport of Bodies.

While disease has been repeatedly introduced and spread by the movements of Shiah pilgrims, it is noteworthy that it has apparently never been so by the movements of Shiah corpses. No instance could be traced in which either plague or cholera—the two diseases mainly dealt with under the International Conventions—had been imported or diffused by these dead bodies. How far this is to be ascribed to the measures in force is uncertain. Possibly such bodies do not in any case constitute a great danger, but it is certain that all measures tending to diminish the number of bodies and to lessen the offensiveness of this Shiah custom are to be commended.

(*a*) *Regulations for Fresh Bodies.*—As already stated, no fresh body is, in principle, admitted for burial at Kerbela or Nejef, unless death has occurred at a place not more than 12 hours' journey from those cities. Consequently (save in the case of contraband), no such bodies came from other countries, except in cases where by request of the relatives a body less than three years dead was admitted by special decision of the Constantinople Board. Such requests had become very common of recent years, and the Board always granted them provided certain conditions were fulfilled. These conditions were laid down in the "Regulations respecting Exhumations in Constantinople," drawn up in the year 1862. The Commission proposed to generalise such decisions, and to decide that fresh bodies could always be admitted provided these regulations, which were very strict, were complied with. Each body would be required to be accompanied by a medical certificate to the effect that death had not occurred from infectious disease; and it was further required that the body be placed in a lead coffin, of at least three millimetres thickness, completely filled in with sawdust soaked in a disinfecting solution (sulphate of zinc or iron). This coffin was to be placed in a wooden case or outer coffin, at least three centimetres thick, closed with screws, and bound with three iron bands. It was also proposed to admit "fresh" bodies from Turkish territory, if the above conditions were fulfilled. This would have done away with the "12 hours' zone"; but, on the other hand, it would have made the transport of such bodies so troublesome and costly that it was expected to have greatly reduced their numbers.

In addition to the bodies coming to Kerbela and Nejef from elsewhere, there are naturally many burials of the inhabitants of those towns. The population of Kerbela is estimated at 50,000, and that of Nejef at 30,000. With a mortality of only 25 per 1000 (it is probably much higher) there would be 1250 interments a year in Kerbela and 750 in Nejef. But to the permanent population have to be added the pilgrims staying there, and particularly the "mujavirs"—Shiahs who spend many months and even years here, among whom are many old and infirm and even moribund, who come to the cities solely with the object of dying there.

The repulsive conditions resulting from the burial of fresh bodies in the mosque precincts have already been referred to. The Commission proposed to prohibit all such interments, except in certain exceptional instances. In all countries the burial of bodies in churches or mosques in the interior of a town has in recent times been more or less prohibited, and such interments were already prohibited in Constantinople by certain regulations published in 1868. In those regulations exception was made only for members of families who possessed *turbehs*, or masonry-lined tombs hermetically sealed, "of ancient date," and for certain "hauts personnages." The Commission proposed to apply this code strictly in the Shiah cities. The interdiction would have been surrounded by conditions such that no religious sentiment would be touched, and it would have applied solely to fresh bodies. The inhabitants of the cities would have had no real cause of complaint, since it would have been easy for them to bury their dead in the cemetery outside the town and transfer the remains three years later to the mosque precincts.

It was further proposed to permit those of the inhabitants who could prove that they possessed family tombs to bury their dead in these, even in a fresh state, but only on certain conditions. Thus positive proof would be required that the family possessed such tomb, and, secondly, the privilege of burying fresh bodies would have been granted only on payment of a much heavier *defnieh* tax than at present; the Commission proposed to multiply the existing tax by ten. Since the actual tax varies from £T.1 to £T.60, the future tax would have varied between £T.10 (£9) and £T.600 (£540). Exception would also have been made for the interments of the "hauts personnages" already referred to.

(*b*) *Regulations for "Dry" Bodies.*—Dry bodies from other countries arrive either by way of Basra or across the Persian frontier. At Basra very few bodies are imported from India. After the appearance of plague in India the importation of such bodies was prohibited for several years. Since 1909 they have been admitted, but only if coffined in the elaborate manner described above. The Commission considering that "dry" bodies offer no real danger to the public health, proposed that they should be admitted to Turkish territory if furnished with a certificate from the proper authority to the effect that death had occurred at least three years before.

All bodies entering Turkish territory were subject to a sanitary tax of 50 piastres (8*s*. 4*d*.) at the frontier, just as all travellers coming from Persia were subject to a sanitary tax of 10 piastres. The vast majority of corpses came by the Kermanshah-Khanikin-Bagdad route, and were subject to inspection at Kermanshah and Khanikin, and at any other place where there was a sanitary office.

"Sanitary Contraband" in Dead Bodies.

It is evidently much more difficult to smuggle a fresh body through than a sack or box of bones. Consequently such attempts, which were not infrequent at Khanikin, were usually discovered and frustrated. But a certain number of bodies did evade the authorities, and crossing the frontier at some other point, followed devious routes over the desert and ultimately reached the holy cities. Still more numerous were the bodies coming from places in Turkish territory beyond the 12 hours' zone. Many fresh bodies arrived with certificates from places situated at least 24 or 48 hours away from Kerbela or Nejef, by the quickest mode of travelling. In other cases persons bringing bodies from outside the zone, or even from Persia, got the original certificate exchanged for another in some village or town within the 12-hours' zone. All these troubles would have disappeared had the Commission's proposals, above set forth, been adopted.

It is not rare for corpses to be brought secretly, at night, accompanied by armed bands of Arabs or Kurds, numbering some scores, or even hundreds, who bury the corpses in the cemetery outside the town without any formalities being complied with. Such contraband will probably always exist, for it could only be met by using armed forces superior to the others, and in each instance many lives would probably be sacrificed.

Contraband in fresh (and dry) bodies was largely exercised by persons in the holy cities who made a profession of the practice. It seems that all the principal towns in Persia and Mesopotamia had representatives or commissioners in the Shiah cities; they were generally

grave-diggers, muleteers, khan-keepers, *khadims* (pilgrim-guides), and even *sayids* and *ulemas*, who thus gained a very considerable income. The bodies were addressed to such commissioners, who would go out into the desert to meet them and give the bearers false certificates, testifying that death had occurred within the 12-hour zone.

In order to put a stop to such acts of contraband, and to encourage the sanitary employees in the strict application of the new regulations, the Commission proposed a system of fines and rewards. Every person detected in acts of contraband would have been heavily fined, and a portion of the fine would have been given to the sanitary employee denouncing them, while the remainder would have been paid into the Board of Health's Pensions Fund. It was further recommended that the fine in the case of fresh bodies should be ten times as great as in the case of dry bodies. If the offence were repeated the fine was to have been doubled; and for a third or subsequent offence the penalty would be a term of imprisonment without the alternative of a fine.

Contraband in "dry" bodies was mainly, if not solely, practised in order to evade the payment of the 50-piastre sanitary tax at the frontier and the 50-piastre stamp duty which was collected by the Turkish consul at Kermanshah on bodies coming by that route. Small as these sums may appear, acts of contraband were exceedingly frequent and often contrived with much ingenuity. The commonest form of contraband was the carriage of bodies by routes avoiding Khanikin and the other towns where there were sanitary offices. But there were many other forms of contraband, and gruesome stories are told of the methods practised. Bags of bones were hidden in bales of goods, such as carpets, rice, hay, barley or other grain, in parcels of loaves or in the saddle of a camel. Two or three bodies were placed in a single sack or box, in the hope that they would pass as one. Sometimes a woman would hang round her waist, under the clothes, the bones of a relative, and declaring herself enceinte would attempt to pass the sanitary officials; but since a female inspector was appointed at Khanikin this form of fraud has ceased. On one occasion a woman was detected carrying in her arms what purported to be an infant, but which proved to be a sack of bones on which a child's face had been rudely painted; it was only the exaggerated way in which she was caressing the bundle that led to her detection. Shiahs have been known to reduce the remains of their relations to powder and attempt to pass this through as flour. Briefly, every conceivable trick is adopted to smuggle through dry bodies with or as commercial goods.

But there is also another form of contraband, which consists in attempting to smuggle through goods with dead bodies. The bodies are placed in a coffin or box, and surrounded by valuable merchandise, such as saffron, camphor, and even fruits of various kinds, in the hope that the box will not be opened and that the goods will thus escape the heavy customs dues to which they are liable.

Hitherto the only means of dealing with such forms of contraband lay in the vigilance of the sanitary employees. When detected a fresh body in contraband was seized and buried in the nearest cemetery; and a dry body was kept in a depôt until claimed and the sanitary dues paid. No punishment could be inflicted, since no law or regulation existed to authorise it. Probably only a system of heavy fines, as proposed by the Commission, will put an end to these abuses; and it is certain that, whatever Power may be in authority in these regions in the future, unceasing vigilance will need to be exercised if the offensiveness of this transport of human remains is to be kept within reasonable limits.

Under existing circumstances it is probable that both the Shiah pilgrimage and the carriage of bodies have been almost, if not quite, suspended until peace shall come again. The future of this part of the world is, and must remain until then, a matter of uncertainty. There is no doubt that the importance of this great movement of pilgrims, living and dead, towards the holy places will be recognised, and that the religious susceptibilities of the followers of this branch of Islam will be fully respected. New measures will be required for doing away with or reducing to a minimum the offensiveness and danger to public health of this outstanding feature of Shiahism; and these will no doubt be devised and carried out more successfully than those hitherto attempted to be applied by Turkey.

Any idea of attempting to put a stop altogether either to the pilgrimage or the carriage of bodies would have to be abandoned from the outset. Both are too deeply rooted and too essential a feature of the Shiah religion for any such attempt to succeed. They have occasionally been suspended by certain Governments—as by the Persian Government in 1904, when cholera was raging in Persia, or by the Indian Government after the appearance of plague in India. But it has always been understood that such suspensions were only temporary, and as soon as the interdiction has been removed the number of pilgrims and dead bodies has increased enormously in the immediately following years, showing that the pilgrimage, in life or after death, had merely been postponed until a more favourable period.

THE SERVICES.

PROMOTIONS IN THE INDIAN MEDICAL SERVICE.

IN view of the present great need for experienced officers in the Indian Medical Service, the Secretary of State for India has approved a proposal of the Government of India to retain in their appointments, when it is considered desirable in the public interest, colonels of the Indian Medical Service after they have completed the ordinary period of tenure or would in ordinary circumstances be placed on the Retired List. In order, however, to obviate the block in promotion which would thereby occur, such officers are regarded as supernumerary in their rank, and promotions are being made in succession.

For similar reasons the following special arrangements have also been made in the case of lieutenant-colonels who, under the terms of the Royal Warrant governing promotion in the Indian Medical Service, may be specially selected for increased pay for ability and merit. The number of officers eligible for this increase of pay is at present fixed at 41. Among such of these as retire in any one year four extra pensions of £100 per annum are distributable subject to certain conditions. Retirements being suspended during the war, the Secretary of State for India has decided as a measure of relief: (1) that, provided there are a sufficient number of applicants to satisfy the required conditions, these four extra pensions, which would otherwise lapse, shall be allotted in each year, but that payment of the extra pensions shall be held over until the allottees have actually retired; and (2) that such recipients shall be regarded as supernumerary on the list of 41 selected lieutenant-colonels and that promotions to the list shall be made in their place.

ROYAL NAVAL MEDICAL SERVICE.

The following appointments have been notified:—Fleet-Surgeons: H. H. Gill to *Pembroke;* and J. H. Fergusson to *Vivid*. Staff-Surgeons: J. H. L. Page to *Pembroke;* J. M. Hayes to *Penelope;* and M. T. Male to *Vivid*. Surgeons (temporary): H. C. Broadhurst to *Dublin;* J. A. McVea to *Mars;* W. L. Anderson and E. P. L. Hughes to *Pembroke;* R. Tennent to *Excellent;* T. R. F. Kerby to *Queen;* T. H. W. Idris and T. W. Drummond to *Vivid;* and D. P. Brown to *Ganges*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surgeon: J. H. F. Lamb to *Victory*. Surgeon Probationers: D. E. Ross to *Linnet;* E. P. Brockman to *Jackal;* C. G. Terrell to *Laverock;* T. A. H. Smith, F. P. N. Parsons, C. C. R. Downing, and W. S. Sykes to *Pembroke;* A. W. Kirkman, A. R. Matheson, J. Hale, D. A. Cunningham, and R. A. Hickley to *Victory;* F. J. Lees, P. MacMurray, S. C. Woodhouse, H. Donovan, A. P. Bertwistle, A. G. Ord, G. E. Morgan, G. W. Pratt, J. Stewart, R. E. R. Sanderson, J. N. Gale, S. H. Waddy, E. J. G. Sargent, J. Allan, W. G. Robertson, and P. Lloyd-Williams to *Victory;* H. S. Trefry to *Nereide;* and J. M. Ritchie to *Victory*.

ARMY MEDICAL SERVICE.

Temporary Honorary Major S. M. Smith (Captain, R.A.M.C., T.F.), from St. John Ambulance Brigade Hospital, to be temporary Colonel.

ROYAL ARMY MEDICAL CORPS.

G. M. Huggins to be temporary Captain.

Stanley Bousfield to be temporary Honorary Major whilst in charge of Aubrey Lodge and Moray Lodge Hospitals.

Captain H. Wade, R.A.M.C. T.F., to be temporary Lieutenant-Colonel.

The undermentioned to be temporary Majors: Captain W. C. Bosanquet and Captain A. D. Reid.

Temporary Captain F. S. Brereton to be temporary Major.

Temporary Lieutenant A. Robinson relinquishes his commission on account of ill-health.

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

Lieutenant (on probation) B. C. Anderson is confirmed in his rank.

The undermentioned to be Lieutenants: L. J. F. Bull, from University of London Officers Training Corps; F. B. Macaskie; F. Camm, from Sheffield University Officers Training Corps; B. J. Daunt, from Royal College of Surgeons in Ireland Officers Training Corps; W. Saunderson, from Queen's University, Belfast, Officers Training Corps; H. J. Wright, from University of Dublin Officers Training Corps; D. H. Anthony, from University of London Officers Training Corps; B. E. Jerwood, from University of London Officers Training Corps; W. R. Dickinson, from University of London Officers Training Corps; F. B. Jago, from Manchester University Officers Training Corps; and T. Wilson, from Manchester University Officers Training Corps.

INDIAN MEDICAL SERVICE.

The King has approved the relinquishment by Framroze Manackji Vajifdar of the temporary rank of Lieutenant.

The King has approved the retirement of Lieutenant-Colonel J. N. MacLeod, C.I.E.

The King has approved the grant of the temporary rank of Lieutenant to C. A. L. Mayer.

TERRITORIAL FORCE.

Army Medical Service.

Lieutenant-Colonel (temporary Colonel) H. G. Falkner relinquishes his temporary rank on vacating the appointment of Assistant Director of Medical Services.

Royal Army Medical Corps.

Highland Field Ambulance: Lieutenant A. J. McIvor to be Captain.

East Lancashire Field Ambulance: Captain G. Bailey resigns his commission on account of ill-health. Lieutenant J. R. Jagger to be Captain.

Welsh Field Ambulance: Lieutenant J. S. Wallace to be Captain.

London Sanitary Company: The undermentioned Lieutenants to be Captains: E. P. Wheeler, W. J. F. Mayne, A. F. Girvan, and D. Porter.

North Midland Casualty Clearing Station: Lieutenant C. Cooke to be Captain.

East Lancashire Divisional Sanitary Section: Lieutenant N. S. Golding to be Captain.

Lowland Casualty Clearing Station: W. Anderson to be Lieutenant.

Attached to Units other than Medical Units.—Lieutenant A. L. Bodley to be Captain. Lieutenant-Colonel H. G. Falkner, from Army Medical Services, to be Lieutenant-Colonel.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In the 96 English and Welsh towns with populations exceeding 50,000 persons at the last Census, 7644 births and 3855 deaths were registered during the week ended Saturday, Sept. 2nd. The annual rate of mortality in these towns, which had been 10·6, 10·5, and 10·9 per 1000 in the three preceding weeks, rose in the week under notice to 11·6 per 1000 of their aggregate civil population, estimated at 17,312,295 persons for the year 1915. During the first nine weeks of the current quarter the mean annual death-rate in these towns averaged 10·9, against 10·7 per 1000 in London. Among the several towns the death-rate last week ranged from 2·4 in Blackpool, 5·6 in Coventry, 6·2 in Great Yarmouth, 6·3 in Ealing, and 7·1 in Ilford to 17·0 in Hull and in Merthyr Tydfil, 17·1 in South Shields, 17·4 in Grimsby, 17·9 in Liverpool, and 18·1 in Gateshead.

The 3855 deaths from all causes were 240 in excess of the number in the previous week, and included 511 which were referred to the principal epidemic diseases, against numbers increasing from 212 to 376 in the six preceding weeks. Of these 511 deaths, 388 resulted from infantile diarrhœal diseases, 50 from measles, 27 from diphtheria, 24 from whooping-cough, 15 from scarlet fever, and 7 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 1·5, or 0·4 per 1000 above that recorded in the two previous weeks. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had steadily increased from 46 to 266 in the six preceding weeks, further rose to 388, and included 92 in London, 43 in Liverpool, 28 in Birmingham, 20 in Leeds, 16 in Manchester, 13 in Hull, 11 in Sheffield, and 10 each in West Ham and Bootle. The deaths referred to measles, which had been 54, 55, and 44 in the three preceding weeks, rose to 50, of which 14 were recorded in London, 7 in Liverpool, and 3 in Sheffield. The fatal cases of diphtheria, which had been 38, 45, and 21 in the three preceding weeks, rose to 27; 7 deaths belonged to London and 2 each to Stoke-on-Trent, St. Helens, and Leeds. The deaths attributed to whooping-cough, which had been 34, 30, and 28 in the three preceding weeks, further fell to 24, and included 6 each in London and Birmingham and 3 in Walsall. The deaths referred to scarlet fever, which had been 9, 6, and 12 in the three preceding weeks, further rose to 15, and included 2 each in London, Liverpool, Manchester, Salford, and Hull. The fatal cases of enteric fever, which had been 4, 12, and 5 in the three preceding weeks, rose to 7, of which 2 occurred in London.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had declined from 1221 to 1005 in the five preceding weeks, further fell to 1000 on Saturday last; 145 new cases were admitted during the week, against 136, 98, and 111 in the three preceding weeks. These hospitals also contained on Saturday last 1239 cases of diphtheria, 162 of measles, 112 of whooping-cough, and 37 of enteric fever, but not one of small-pox. The 883 deaths from all causes in London were 30 in excess of the number in the previous week, and corresponded to an annual rate of 10·7 per 1000. The deaths referred to diseases of the respiratory system, which had declined from 99 to 75 in the four preceding weeks, further fell to 66 in the week under notice.

Of the 3855 deaths from all causes in the 96 towns, 148 resulted from violence, 305 were the subject of coroners' inquests, and 1140 occurred in public institutions. The causes of 34, or 0·9 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Sheffield, Leeds, Bristol, West Ham, Bradford, and in 69 other smaller towns. Of the 34 uncertified causes, 5 were registered in Birmingham, 3 each in Manchester and Gateshead, and 2 each in London, Stoke-on-Trent, Liverpool, and Preston.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,372,000 persons at the middle of this year 1038 births and 532 deaths were registered during the week ended Saturday, August 26th. The annual rate of mortality in these towns, which had been 11·2, 12·2, and 11·7 per 1000 in the three preceding weeks, was again 11·7 per 1000 in the week under notice. During the first eight weeks of the current quarter the mean annual death-rate in these towns averaged 11·9, against a corresponding rate of 10·8 per 1000 in the large English towns. Among the several towns the death-rate during the week ranged from 5·3 in Hamilton, 7·6 in Aberdeen, and 8·6 in Perth, to 13·0 in Glasgow, 14·9 in Coatbridge, and 15·6 in Ayr.

The 532 deaths from all causes were 2 less than the number in the previous week, and included 68 which were referred to the principal epidemic diseases, against 46 and 48 in the two preceding weeks. Of these 68 deaths, 52 resulted from infantile diarrhœal diseases, 7 from scarlet fever, 5 from measles, and 4 from whooping-cough, but not one from enteric fever, diphtheria, or from small-pox. The annual death-rate from these diseases was equal to 1·5, against 1·1 per 1000 in the large English towns. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had increased from 7 to 29 in the five preceding weeks, further rose to 52, and included 38 in Glasgow, 4 in Greenock, and 2 each in Paisley, Coatbridge, and Hamilton. The deaths attributed to scarlet fever, which had been 5, 3, and 4 in the three preceding weeks, rose to 7, and included 2 each in Glasgow and Paisley. The 5 fatal cases of measles were slightly below the average in recent weeks, and comprised 2 each in Glasgow and Leith and 1 in Clydebank. The deaths attributed to whooping-cough, which had been 3, 11, and 7 in the three preceding weeks, fell to 4, of which 2 were registered in Glasgow.

The deaths referred to diseases of the respiratory system, which had been 58, 61, and 61 in the three preceding weeks, fell to 54 in the week under notice, and were 4 below the number registered in the corresponding week of last year. The deaths from violence numbered 32, against 27 in each of the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the registration district of Dublin 152 births and 147 deaths were registered during the week ended Saturday, Sept. 2nd. The annual rate of mortality, which had been 16·4 and 14·4 per 1000 in the two preceding weeks, rose to 19·3 in the week under notice, against 10·7 and 14·9 per 1000 in London and Glasgow respectively.

The 147 deaths at all ages were 37 above the number in the previous week, and included 42 of infants under 1 year, and 24 of persons aged 65 years and upwards. Thirty-one deaths (of infants under 2 years) were referred to diarrhœal diseases, 3 to enteric fever, 2 to whooping-cough, and 1 each to measles and scarlet fever. The causes of

4 deaths were uncertified, and 3 others were the subject of coroners' inquests, while 63, or 43 per cent., of the total deaths occurred in public institutions.

During the same period 202 births and 117 deaths were registered in the city of Belfast. The deaths corresponded to an annual rate of 15·6, or 0·8 per 1000 less than in the previous week, and included 26 of infants under 1 year, and 28 of persons aged 65 years and upwards. Eleven deaths (of infants under 2 years) were referred to diarrhœal diseases, but not one to any other of the principal epidemic diseases. The cause of 1 death was uncertified, and 3 others were the subject of coroners' inquests, while 31 of the total deaths occurred in public institutions.

Correspondence.

"Audi alteram partem."

THE APPLICATION OF DROP-MEASURING TO THE WIDAL TECHNIQUE.

To the Editor of THE LANCET.

SIR,—In his article on a method of drop-measuring liquids and suspensions, published in THE LANCET of Sept. 2nd, Mr. R. Donald is impelled by a sense of "public duty" to point out "serious inaccuracies" in the "Directions" for the "Use of Standardised Agglutinable Cultures" issued under the auspices of the Medical Research Committee. He also criticises with severity both the materials and the technique of Dreyer's method of performing agglutination tests. And readers of THE LANCET are warned that he has discovered gross errors in them of such magnitudes as 10 per cent., 20 per cent., and even 40 per cent., along with many other faults and failures of lesser degrees, but of undoubted importance. Moreover, Mr. Donald, whether intentionally or otherwise I cannot say, leaves the impression that all these various errors are cumulative. Of six precautions which instructed persons know to be "necessary for practical accuracy in methods based upon drop-measurement" no less than four are entirely omitted, and the other two are only vaguely hinted at by those who instigated the issue of the "Directions." Other most culpable things have also been done or left undone by us.

These are dreadful charges, Sir, painful to bear! If only Mr. Donald had remembered that legend of the bar in Colorado where the notice stands above the pianoforte "Please do not shoot at the pianist, he is doing his best," he would, I feel sure, have dealt more gently with us. But you, Sir, are sympathetic to all those in trouble; and I may venture to assure you, in some sort of palliation of our faults, that we in Oxford do really try very hard to understand these high matters, in which Mr. Donald is so very facile, and to get them right before we put them into print.

Doubtless in our youth we have been as hasty in judgment and as reckless in statement as here and there you may still find another. But advancing middle age brings caution even to the foolish. Mr. Donald is mistaken. We have not committed all the follies he imagines. Most of the things that he says in criticism of us are not so. But to deal with them in detail will require more space than is proper for a letter, and will occupy more leisure than I have at my disposal at the moment. I live in hope, however, that I may shortly be allowed the necessary opportunity in your columns. Meanwhile, may I tell your readers briefly that Mr. Donald's 40 per cent. error is one manufactured entirely by himself without any help from us by doing things which, as he admits elsewhere, are implicitly forbidden in the "Directions." Further, his errors of 20 per cent. and 10 per cent. respectively are not cumulative, but happen to be so distributed—and were known by us to be so distributed—as very largely to counterbalance one another. They thus leave as residue an ascertainable and constant error in the *reputed* degree of final serum dilution (but in nothing else). And this error is of a size (about 3 per cent.) which is quite negligible in relation to the purposes for which the method is intended to be used where we are dealing with changes of hundreds per cent.—I am, Sir, yours faithfully,

E. W. AINLEY WALKER.

University College, Oxford, Sept. 4th, 1916.

THE CHOICE OF ANÆSTHETIC AT A MILITARY HOSPITAL.

To the Editor of THE LANCET.

SIR,—When administering to each patient the anæsthetic believed to be best suited to his individual case, it has also been customary to measure the quantity of the anæsthetic used and to note the time spent over each operation. The cost per hour for each anæsthetic was then estimated. Taking a sequence of about a hundred cases at random I find we have used:—

Open ether in 7 at an estimated cost of about 2*s.* 6*d.* per hour. Ether in a Clover's inhaler (with an oxygen attachment) and preceded by 5 c.c. ethyl chloride in 19 at 10*d.* per hour.

Chloroform in an open mask in 14 at 8*d.* Acomb's pattern of mask preferred to avoid all risk of burning the face. Ethylic chloroform in a Vernon Harcourt inhaler with oxygen attachment in 6 at 2*d.*

$A_1C_2E_3$ in Rendle's celluloid mask in 17 at 1*s.* E_2C_3 in McCardie's mask in 4 at 11*d.* E_2C_1 on open mask in 3 at 1*s.* 6*d.*

For foreign bodies with inflammatory swelling about the neck: 8 ounces of 75 per cent. solution of ether and olive oil as rectal enema (2*s.* 6*d.* per hour) in 4 cases when single-handed. Intraspinal stovaine in 3 at about 1*s.* (2 c.c. of 5 per cent. solution), also novocaine and omnopon scopolamine, in doses varying with the body weight and general condition of the patient. Ethyl chloride either by crushing successive 3 c.c. capsules in a bag or by Barton's method for operations usually up to a quarter of an hour in length (in one case 55 minutes), 11 at 6*s.* 6*d.* per hour.

"Warmed" gas and oxygen (including 4 cases of amputation through the thigh in which the patients had always taken ether and chloroform very badly), 8 at 9*s.* 6*d.* per hour. Intravenous ether (Rood's apparatus), 6 at 1*s.* per hour. Alcohol 1 and chloroform 9 in gas poisoning on open mask, combined with oxygen, 3 at 1*s.* 8*d.* per hour.

The conclusions arrived at are as follows:—

1. In a large military hospital the Vernon Harcourt chloroform inhaler should be looked upon rather as an economy than a luxury, owing to the great saving of chloroform.

2. In cases requiring transfusion for hæmorrhage or shock we are strongly in favour of intravenous alcohol, especially in operations about the face and head, where the anæsthetist is apt to impede the surgeon.

3. Open ether is opposed on the ground of expense. When this method is employed we use a Fergusson's mask with flannel cover and "speed up" with 10 c.c. ethyl chloride.

4. It may be regretted that ethyl chloride is not more used. Owing to the rapidity of induction and speediness of recovery it presents peculiar advantages. For 15 years I have used it, as a routine adjuvant to ether and chloroform, always with a suitable mouth-prop, often with an oxygen attachment in the case of a closed inhaler, and have had no serious trouble with jaw spasm or even with the marked fall in blood pressure which follows prolonged administration. It is, of course, a dangerous drug without proper precautions and accurate dosage; I collected a list of 34 fatalities under this drug 12 years ago.

5. Nitrous oxide has been employed very extensively for operations in the wards and prolonged and painful dressings. The apparatus recommended is composed of a flanged rubber face-piece (not celluloid), Clover-Hewitt's wide-bore gas and ether inhaler, to which is attached a small thin bag (Page) (as an additional mixing chamber), a long tube running thence backwards (through hot water) to the small mixing chamber controlled by side valves and ratchets and communicating with very strong storage bags, enclosed in stout string (or compressed by Trewby's springs). These bags are supplied from the ordinary angled bottles and operated by foot screws in the usual way. The Dental Manufacturing Company, Alston House, London, made a suitable stand and apparatus for us to carry out these ideas, and their work has given us the utmost satisfaction and relief to the patients.

The advantages of the apparatus are: 1. It can be used with ordinary angled bottles and not vertical bottles, which are often unobtainable. 2. The gases can be warmed satisfactorily. 3. Re-breathing can be allowed or not as desired. 4. In the hands of a beginner, a small quantity of ether may be added with advantage in perhaps 40 per cent. of cases, till practice has made perfect. 5. In case the supply

of oxygen gives out an air-intake can be opened in the mixing chamber and air employed instead of oxygen. 6. If the nitrous oxide runs short, the Hewitt's air-inlet may be opened and ethyl chloride sprayed in without disturbing the operator or the patient. 7. The pressure of gases can be regulated as desired.

A more extensive use might be made of nitrous oxide in septic cases, and the routine administration of omnopon 2/3 grain and scopolamine 1/100 grain one hour before the administration. We often combine with local anæsthesia and find the method satisfactory.

During the last eight months I have almost exclusively employed a Shipway's three-bottle and thermos apparatus for inhalation anæsthesia. It is preferable to modify the method and induce rapidly with a mixture of Eau de Cologne and ethyl chloride sprayed on to a Vajna's glass mask covered with three layers of domette. It is not safe to employ a stronger mixture than one part of alcohol to five of chloroform in the third bottle, as it has been shown that 6 per cent. vapour can be produced by a Junker's inhaler similar to the above. Moreover, instead of a hand bellows, we connect our ether bottle by a Y-tube to a foot bellows and large oxygen cylinder controlled by a Barth's regulating pressure valve. The cost is about 1*s.* 4*d.* per hour.

Increasing experience points to the value of intravenous alcohol in carefully selected cases *only*. In the last month I have given intravenous alcohol on 36 occasions when the condition of the patient appeared grave, a 20 per cent. solution of alcohol in normal saline guaranteed chemically pure, sterilised and made up in hermetically sealed bottles by Messrs. Duncan, Flockhart & Co. of Edinburgh. About one pint of the solution was usually sufficient for an hour's operation at a cost of 2*s.* 3*d.* An ordinary salvarsan needle was used. The cases were mostly of a grave nature and included—2 of pulmonary abscess; 3 laparotomies (1 exploratory and 2 resection of bowel); 1 case of double amputation through the thigh; 1 amputation through the shoulder joint for rapidly spreading gas gangrene with delirium (the worst case I have ever seen recover); 1 amputation through the thigh in which the patient had previously become pulseless under open ether when the operation had to be abandoned, but is now strong and well. Complete anæsthesia was usually induced in seven minutes.

The after sleep averaged two hours and the secondary collapse one hour after operation was met by enemas of hot coffee and hypodermic injection of pituitary extract. No hæmolysis has yet been met with or the rigors which are so common after intravenous ether, though I have frequently noticed fibrillary twitchings of the masseter muscles. It is hoped that the antiseptic effects of weak alcohol may be of some small value in septic cases, and that the drug may be less likely to injure the kidneys than ether.

I am, Sir, yours faithfully,

ARTHUR G. WILKINS,
August 14th, 1916. Temporary and Honorary Captain, R.A.M.C.

THE NATURE OF STUTTERING.

To the Editor of THE LANCET.

SIR,—Stutterers are usually refused admission to the Army. In munition works their efficiency is lessened by their difficulty in communication. In ordinary civilian life they are an annoyance to others and a curse to themselves. The present methods of the treatment of stuttering are almost hopeless. A stutterer will be admitted to a hospital for rest and feeding for a few weeks; in the out-patient departments he will receive tonics and purges; if able to pay he will go to the elocutionists or advertising stammer-curers; the result is always the same. The reason lies in the misconception of the nature of the trouble. Stuttering is not a bad habit; it is not a speech defect; it is not even a speech disease. I have made and analysed records of speech in the most varied diseases and defects of the peripheral organs, the nerves, the bulbar centres, and the cortex. Every part of the speech mechanism has been thoroughly covered; typical and constant results have been found for each form of lesion. The records of stutterers show that the speech mechanism is absolutely intact.

The real nature of stuttering is indicated by the following facts. In the first place, the stutterer's spasm varies from case to case; no two persons stutter alike. Again, it varies from sentence to sentence, from word to word; a stutterer who stumbles over the initial of "Peter" may have no trouble with any other "p" in the sentence. Finally, it varies from time to time and from circumstance to circumstance; a person who stumbles over initial consonants at one time will be found another time to have only silences due to abdominal cramps. There is no such variability in the true diseases of the speech mechanism. A conclusive proof that stuttering is not a defect of speech is furnished by the fact that every stutterer can speak perfectly well as long as he is alone. In the entire literature of stuttering I have never seen this fact recorded, and yet it is the most significant one of all. I have verified the fact by questioning thousands of stutterers. A striking illustration is provided by the experience that every stutterer can speak into a telephone perfectly as long as he holds the switch down so that no one can hear him; as soon as he releases it and connects the telephone with the central, he begins to stutter.

The pathology of stuttering must be sought in the stutterer's higher mental mechanism. There is a large group of persons—not stutterers—whose life is spent in a fear of meeting other people and with a strain in their presence. The mental condition of these persons and of the stutterers is exactly the same. The bodily signs are also similar; in both the muscles are more tense than they should be. There are even resemblances in speech; in the non-stutterers there is sticking at words, sometimes repetitions, but never any of the cramps of the stutterer. All these people have a mental condition that impels them to avoid other persons and incline toward segregation. The clinical picture is so exactly the same for all that one inclines to divide the entire lot into stutterers who do not stutter and stutterers who do; more correctly they would all be called victims of the timidity neurosis. The non-stutterers far outnumber the actual stutterers.

Why should stuttering arise on the basis of a timidity neurosis? Let us suppose that a person deliberately wished to make it impossible or difficult for him to associate with other people. He might counterfeit some disease that would remove him from their company. He might pretend deafness or muteness. Best of all, he might speak in a way that would make it difficult or impossible to talk with other people; this he could most readily accomplish by stuttering purposely. Now let us suppose that such a wish may be present in a person's mind quite unknown to himself. Then we have just the condition of the hysterical girl who unconsciously counterfeits meningitis when the family troubles are too much for her, or of the sufferer from shell shock who is a loyal soldier but whose innermost nature tries to prevent a return to the horrors of war by producing psychic deafness and mutism. The most effective way of cutting off social intercourse is to play the fool by stuttering. Not infrequently after long struggles with a patient I have been forced to the conclusion that he really did not wish to be cured. One young man had been his mother's pet as a boy. Later as a stutterer he monopolised her entire affection and retained his attitude of dependence and need of protection. If cured he would lose the intense sympathy of his mother, and would be forced into the world to work for himself. Another young man had made great sacrifices to effect a cure. He was earnest and faithful. Yet one could feel a resistance. His stuttering brought him the advantage of an excuse to avoid feminine society. In justice to these patients it must be said that they did not suspect any such motives. Intimate acquaintance with many cases has led me to the belief that the great cause of stuttering is an unconscious wish to avoid human society. The disease may be termed a timidity neurosis, whose external mechanism is a speech defect that assists the person to segregate himself. Stuttering is therefore closely allied to hysteria, to the anxiety neurosis, to the phobias, &c. It must not be supposed that the stutterer knows anything about this unconscious desire for segregation. As in hysteria, the stronger the unconscious desire the greater is the person's conscious effort. The stutterer whose unconscious mind is most set toward segregation is just the one who is most diligent and self-sacrificing in seeking a cure.

The treatment of stuttering on the supposition that it is a disorder of the speech mechanism must fail, and does fail. Elocution exercises usually aggravate the disease. A stutterer can readily be taught to speak in a queer voice, but the cure is worse than the disease and it is almost never permanent. Hypnotic treatment aims at giving the person

confidence in his speech; this confidence is shattered every moment by his stuttering; I have never known hypnotic treatment to effect a cure. Psycho-analysis is useful in getting at the stutterer's unconscious mind, but used alone it cannot succeed. The actual treatment of the stutterer is a very complicated and delicate matter where a mistake in any or one of the many methods employed may make a cure impossible. It involves a thorough study of the bodily conditions—e.g., an intractable case changed to a cure after an operation on the turbinates. A most minute regulation of home influence and business habits may be essential. A new method of speaking must be taught—namely, normal speech in the presence of other persons. Relaxation of mind and body, spontaneity of expression, equilibrium of the emotions, correctness and precision of thought, correction of character, development of confidence, readjustment to environment—these are all principles on which the treatment must be based.—I am, Sir, yours faithfully,

London, W., August 24th, 1916. E. W. SCRIPTURE, M.D.

THE NATIONAL COUNCIL FOR COMBATING VENEREAL DISEASES AND COMPULSORY NOTIFICATION.

To the Editor of THE LANCET.

SIR,—As some misunderstanding seems to have arisen in regard to the attitude of the National Council for Combating Venereal Diseases towards the question of compulsory notification of venereal disease, we desire to point out that we are determined to adhere strictly to the recommendations of the Royal Commission. That body carefully considered this question and arrived at the conclusion that notification at the present time was impracticable and might be detrimental to the operation of the measures it advocated.

A great mass of evidence was taken, and the balance was strongly opposed to compulsory methods of this nature. The Commissioners, however, recognised that when public opinion became more enlightened and adequate facilities for treatment had been provided, "the question of notification should then be further considered." They added that when these conditions have been fulfilled it is "possible that ..... notification in some form will be demanded."

We are convinced that this view is sound, and the National Council will, therefore, lend no support to any proposals having for their object the establishment of compulsory notification—proposals which would necessarily lead to controversy at a time when unanimity of effort is essential.

We are, Sir, yours obediently,

SYDENHAM, President.
THOMAS BARLOW,
HUBERT M. SOUTHWARK, Vice-Presidents.

Kingsway House, Kingsway, W.C., Sept. 5th, 1916.

"QUININE PARADES."

To the Editor of THE LANCET.

SIR,—The newspapers are publishing pictures of "quinine parades" at Salonica; apparently our soldiers in Greece are being made to swallow quinine in 5-grain doses daily in order to prevent malaria. It is now more than 15 years since this method of trying to prevent malaria was proved futile. Since then it has been again attempted in a number of places and has always met with the same result. At Ismailia the experiment was made under the most perfect conditions possible. Each inhabitant of the town, which is cut off from other places by 40 miles of desert, was obliged to take quinine regularly or to forfeit the means of livelihood. Yet malaria continued there as prevalent as ever. Ultimately, as everyone knows, the disease was abolished by mosquito-reduction and quinine prophylaxis was stopped. Jenner's lesson was only put into general practice after nearly 100 years. Will the story of malaria also require a century of cogitation by administrators? It is almost heart-breaking for those of us who, having broiled for years in hot climates dealing successfully with disease, find now, after two decades of hard-gained knowledge, military authorities reverting to methods which are not only out of date and hard to carry out completely, but are also very costly—5 grains of quinine daily to the personnel of an army is a large order. It is all unnecessary. At Port Said mosquito-reduction was evident within a week of the starting of the anti-mosquito measures, and malaria-reduction at Ismailia began within a month of the mosquito-reduction. Quinine had had no effect in five years.

It is difficult to understand this idea of trying to prevent disease by the cure and treatment of individual cases or possible cases. It has never been successful. Yet it is still being tried even here in England, which should be the home of medical science now that the culture of the German professor has been found out. One of the aims of the National Insurance scheme is the prevention of tuberculosis. The method adopted is the attempt to cure individual cases by sanatorium and dispensary treatment. What is the result? It is doomed to failure. We cannot prevent disease by curing it—quinine and malaria proved that. Then take the example of diphtheria. We can cure diphtheria and we do cure it; but diphtheria is not prevented. And now we are going to make another attempt of a similar nature; it also is doomed to failure. We are going to try to prevent venereal disease by curing it. It cannot be done. They say that experience teaches—but how long does the process take?

I am, Sir, yours faithfully,

St. James-place, S.W., August 28th, 1916. E. HALFORD ROSS.

IMMOBILITY AFTER JOINT INJURY.

To the Editor of THE LANCET.

SIR,—Sir John Collie misquotes me with such marked irresponsibility that it is unnecessary for me to correct him. Moreover, though he may not admit it, he and I are partly in agreement after all: for his view "that as soon as the acute painful stage has passed and inflammation has subsided, the surgeon should prevent subsequent stiffness by commencing movements"—endorses the principle I was contending for, viz., "that a joint must be kept immobilised until the inflammation has entirely subsided."

But is not his advice to the surgeon to commence movements hopelessly wrong? Is it not the advice of one who *sees* cases but does not treat them—of the theorist rather than of the practical man? I pass over Sir John's rather personal remarks, his quaint quotation from Whitelocke, his surprising reference to the Grand Palais and £644,000 a year; and as far as I myself am concerned beg leave to conclude this correspondence by quoting the words of Thomas[1] (would that they were emblazoned on the walls of every hospital!):

"The most effectual method of avoiding ankylosis is the practice of uninterrupted and prolonged immobility.

"The more an inflamed joint is uncontrolled the stiffer does it become, while the more effectually it is fixed the sooner and the more completely is its capability of movement restored."

I am, Sir, yours faithfully,

Harley-street, W., Sept. 2nd, 1916. PAUL BERNARD ROTH.

THE SIGNIFICANCE OF URINE OF A VERY LOW SPECIFIC GRAVITY.

To the Editor of THE LANCET.

SIR,—On two occasions I have observed urines the specific gravity of which gave a reading of zero—one case very recently was in a man of 30, an insurance case; the other occurred many years ago, and for the first time, in a man who is now aged 61, and who has since undergone a bout of severe renal colic, ending with the passage of one oxalate crystal, followed some short time afterwards by a prolonged period of jaundice, characterised by severe colic and pruritus. The case ended in recovery, but the man is now diabetic, his glycosuria being controlled by abstinence from sugar, fresh meat, and butter.

I am, Sir, yours faithfully,

EDWARD P. LEAVY, F.R.C.S., Government Medical Officer.

Innisfail, North Queensland, July 8th, 1916.

[1] Hugh Owen Thomas: Diseases of the Hip, Knee, and Ankle Joints, Liverpool, 1876, p. 172.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Died of Wounds.

Captain T. C. Houston, R.A.M.C., attached to the Cameronians, qualified M.B., Ch.B. Glasg. in 1915, and thereupon joined the R.A.M.C.

Captain J. M. Stenhouse, R.A.M.C., attached to the Royal Field Artillery, was educated at Cambridge University and at the London Hospital, and qualified in 1903. After holding house appointments at the hospital he proceeded to China, and on the outbreak of the European War he obtained a commission in the R.A.M.C.

Wounded.

Surgeon Probationer C. E. E. Herington, R.N.V.R.
Captain A. S. K. Anderson, R.A.M.C.
Lieutenant S. Bryson, R.A.M.C., attached to the Northumberland Fusiliers.
Captain G. M. Campbell, R.A.M.C., attached to the South Wales Borderers.
Lieutenant E. Hudson, R.A.M.C.
Captain R. C. Coatsworth, R.A.M.C.
Captain J. Kirker, R.A.M.C.
Captain H. St. A. Agate, R.A.M.C., attached to the South Wales Borderers.
Second Lieutenant B. J. Courtney, R.A.M.C., attached to the Royal Warwick Regiment.
Captain R. H. Fothergill, R.A.M.C.
Captain J. T. Gunn, R.A.M.C.
Captain J. McKenzie, R.A.M.C.

OBITUARY OF THE WAR.

DOUGLAS HENRY DAVID WOODERSON, B.Sc., M.B. LOND.

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain D. H. D. Wooderson, who was killed in action on August 6th at the age of 24, was the elder son of H. D. Wooderson, of Kingsfield, Dartmouth-road, Brondesbury. Educated at Archbishop Tenison's Grammar School and the Moravian Knaben-Anstalt at Königsfeld in Baden, he had an unusually brilliant career as a medical student, winning during five years at St. Bartholomew's Hospital Medical School the junior entrance scholarship in science, the junior scholarship, the senior scholarship, the Harvey, Wix, Bentley, and Sir George Burrows prizes. At the age of 19 he took the degree of B.Sc. at London University with honours in physiology; and in September, 1914, he qualified as M.B., B.S. Lond., with distinction in medicine and midwifery. Three months later he obtained a temporary commission in the Royal Army Medical Corps, and after some hospital work in Ireland went to the front attached as medical officer to the King's (Liverpool) Regiment. He was invalided home with trench fever in July, returning to his regiment again in October, and he was mentioned in despatches in June of the present year. A few weeks later he was killed by a shell as he was attending to several wounded men.

Captain Wooderson was not merely brilliant at examinations. His commanding officer writes of him as one of the very best regimental officers he had had, and speaks of his love of work and devotion to duty. During his student years he took much interest in foreign missions and acted for some time as secretary to his hospital Medical Missions Society. His friends will cherish the memory of a well-filled life.

GEORGE STANTON, B.A., M.B., B.CH. DUB.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain G. Stanton, who died on August 16th in London as a result of wounds incurred on active service, at the age of 24 years, was youngest twin son of John Stanton, solicitor, of Alexandra Place, Cork. He was educated at the Christian Brothers' College in Cork and at Trinity College, Dublin, graduating in medicine at the University of Dublin in 1915. After joining the Royal Army Medical Corps he was attached as medical officer to a battalion of Lancashire Fusiliers. He was wounded in two places by shrapnel, and after immediate operation in a field hospital continued to make progress after being transferred to this country, until the sudden development of an aneurysm which proved fatal.

Captain Stanton took a prominent part in athletics. As a member of his College Harrier Club he ran against Oxford in his freshman year, and he played wing three-quarter for the Monkstown Rugby Football Club. His death has left a blank among a wide circle in his native city.

RICHARD MOLESWORTH DENNYS, M.R.C.S. ENG.,

CAPTAIN, LOYAL NORTH LANCASHIRE REGIMENT.

Captain R. M. Dennys, who died on active service in France on July 24th at the age of 31, was only son of Edward A. Dennys, of London, and grandson of the late General J. B. Dennys and of Sir Guilford Molesworth, K.C.I.E. He was educated at Winchester, and took his medical course at St. Bartholomew's Hospital, obtaining the Conjoint Board qualification in 1909. At the outbreak of war he was in Florence, working with Mr. Gordon Craig in his school at the Arena Goldoni for the improvement of the art of the theatre. He returned to England at once and offered his services to the Red Cross and the Royal Army Medical Corps, but as he could not obtain immediate employment in either capacity he accepted a commission in the Loyal North Lancashire Regiment. He had been in France with his battalion for all but a year when he received a wound which proved fatal after 12 days.

Captain Dennys was a man of singular adaptability. Although educated for the medical profession and with his chief interest in things theatrical, his commanding officer writes of him: "He set to work with heart and soul to become efficient, and was greatly assisted in its attainment by the exercise, in no small degree, of tact, which more than once saved difficult situations." He adds: "Under the most adverse circumstances Dennys was always cheery; no one ever heard him 'grouse.'" His brother officers write of his qualities of head and heart which endeared him to them and to the men under his command, and of his love for all that is noblest in art, music, and literature.

JOHN PARNELL WALSH, M.D., C.M. McGILL,

CAPTAIN, CANADIAN ARMY MEDICAL CORPS.

Captain J. P. Walsh, C.A.M.C., died on August 17th at the 2nd London General Hospital of shrapnel wounds received at the front, where he was medical officer attached to a battalion of the Canadian Expeditionary Force. Born in Quebec in January, 1882, he had graduated at McGill University, Montreal, in 1909, and on graduation returned to practice in his home city, becoming anæsthetist to the Jeffrey Hale Hospital, and later assistant in medicine with charge of the clinical laboratory of the hospital. He had entered the Canadian Army Medical Corps before the war, being gazetted lieutenant in April, 1914, and in October of that year he was appointed to the staff of the Quebec Military Hospital. In February, 1915 he came overseas, and was appointed to a Canadian General Hospital. He received his injuries on July 20th and failed to rally after a grave operation.

Captain Walsh had rapidly come to the fore in Quebec as a popular and capable practitioner, with great kindliness of manner, and devotion to duty.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Second Lieutenant W. E. Berridge, Somerset Light Infantry, younger son of Dr. W. A. Berridge, of Folkestone, and formerly of Redhill.

Lance-Corporal F. H. Dowker, Royal Fusiliers, only son of the late Dr. F. W. Dowker, of Helmsley, Yorkshire.

Second Lieutenant A. C. A. Adams, Royal Lancaster Regiment, only child of Surgeon-Colonel Adams, M.D.

Captain and Adjutant T. H. B. Rorie, the Black Watch, attached to the Gloucester Regiment, eldest surviving son of the late Dr. J. Rorie, medical superintendent of Westgreen Asylum, Dundee.

Lieutenant E. C. MacBryan, Somerset Light Infantry, second son of Dr. H. C. MacBryan, of Box, Wilts.

THE WAR AND ASYLUM ACCOMMODATION.

In reply to a question asked in the House of Commons with a view of eliciting information as to the amount of overcrowding now existing in asylums, and as to the extent of reduction of accommodation available in them by reason of the temporary use of these institutions by the War Office, the Under Secretary of State said that the overcrowding, expressed as an average, amounted to 17 per cent., and the accommodation had been reduced by 15,750 beds. To have provided such a substantial addition to the resources of the War Department at so slight a hygienic cost is a remarkable achievement, and one upon which the Board of Control, which instituted this movement, and the managing committees of the asylums concerned, are to be congratulated. In these times of unprecedented national stress it could not be expected that any class of the community, rich or poor, healthy or infirm, would entirely escape inconvenience and discomfort. We feel that the relatives of the mentally infirm of the poorer classes have reason to be thankful that the welfare of those in whom they are interested has been so little affected. Even in normal times an overcrowding to the extent of 17 per cent. must be the frequent experience of not a few public asylums serving a densely-populated area. It has to be borne in mind that a degree of overcrowding which might have appreciable results in an ordinary hospital is not by any means necessarily attended by such in hospitals for the insane; since a large proportion of the patients in these are out for exercise or in the open for several hours a day, during which time the wards are well ventilated. That so large a displacement of patients should have been brought about with, on the average, comparatively slight overcrowding, shows that a great number of asylums must have responded to the invitation to coöperate in this praiseworthy effort to help in a national emergency. In times of stress the incidence of insanity is probably distinctly diminished, like that of crime; and overcrowding is less marked to the extent to which the antidote of stress is efficacious. In reply to a further question the Under Secretary of State said that the proportion of doctors to patients in county and borough asylums, in use as such, was 1 to 390. Presuming the medical superintendent to be reckoned amongst the doctors in both instances, this would mean anything between 120 and 140 more patients per doctor than in normal times. These figures in themselves are not alarming; nor is there any sufficient cause for disquietude if the matter is regarded from a more strictly professional point of view. For, if we take the percentage of cases which experience shows are likely to recover amongst the average annual admissions into public asylums as 35, and add 10 per cent. for cases which might be expected to recover with closer personal medical attention than is, or can be, given in ordinary instances, we find that some 175 of the 390 cases allotted to one doctor require his close attention. This is not an excessive figure. As to the remaining 215, their requirements would appear to be fairly comparable to those of the large number of minor surgical and medical cases which are admitted into the hospitals of this country from the front. They can be adequately met by a skilled nursing staff under the supervision of the doctor. As regards the statutory obligations cast upon the Asylum Medical Service in respect to the keeping of medical records and rendering of returns, the Board of Control, in view of the circumstances of the war, took steps at the outset temporarily to relieve medical officers of asylums of some of these.

MEDICAL EXAMINATION AND MILITARY ENLISTMENT.

In a recent Circular issued by the Local Government Board attention is called to the importance of a tribunal knowing for what class of service a man is medically fit before deciding whether he shall be taken from civil employment for the Army. The Circular suggests that it would be well that a man applying for exemption should be examined by a Recruiting Medical Board before his application is disposed of. There is no power to compel him to be so examined, but it is obviously to his advantage to secure trustworthy evidence of his physical condition, because in the absence of it the tribunal would be justified in assuming him to be fit for general service. The military authorities are willing to make the examination in the circumstances indicated. The tribunal in the case of those whom it decides to take has to consider whether the recruit is one of the higher value—that is to say, whether he is fit for general service or whether he is fit for service abroad in garrison or provisional units, so that the adducing of medical evidence at the hearing is an advantage both for the tribunal and for the man who believes himself to be entitled by his condition to exemption.

IRISH DOCTORS OF MILITARY AGE.

The Local Government Board of Ireland will not sanction the appointment by the Letterkenny guardians (co. Donegal) of Dr. J. P. McGinley as dispensary doctor, owing to the fact that he is of military age. In a letter to the guardians the Board points out that to sanction such appointments would be to encroach on the supply of doctors who are urgently required for the care of the wounded. The Board recommends that the work of the dispensary should be carried out until the war is over by a medical man ineligible for military service, who should be paid at the rate of the fixed salary attaching to the post. The guardians decided by 21 to 9 votes to adhere to their action in appointing Dr. McGinley. At their meeting a week later a further letter was read from the Local Government Board refusing to alter its decision, and requesting the guardians to make arrangements for the discharge of the duties of medical officer for the period of the war by a doctor who was ineligible for military service. The guardians replied by placing on the agenda for their next meeting a resolution appointing temporarily during the war the medical man whose permanent appointment the Board had refused to sanction.

At a meeting of the Omagh board of guardians (co. Tyrone), held on August 19th, to appoint a successor to the late Dr. H. B. Fleming as medical attendant to the workhouse, a resolution to the effect that no doctor of military age be appointed was lost by a majority of 25 (26 for, 51 against). Applications were received from four doctors, all of whom were of military age except Mr. J. J. Todd, district medical officer of Omagh. As a result of the voting Dr. D. F. Murnaghan, son of the chairman of the board (who presided), was appointed. At the next meeting of the Omagh board of guardians a letter from the Local Government Board was read, declining to sanction Dr. Murnaghan's

appointment, as to do so would be contrary to its settled policy, which was that all such appointments should be filled for the period of the war only, and, where possible, medical men who by reason of their age are not qualified to serve in the Royal Army Medical Corps should be chosen to fill the temporary posts. In the present case Mr. Todd had expressed his willingness to continue to perform the duties at the salary attaching to the office until the termination of the war, and as this gentleman was over military age and qualified for the position, the Board was of the opinion that his offer of service should be accepted. After a heated discussion, a resolution was passed requesting the Local Government Board to sanction Dr. Murnaghan's appointment and directing the master not to allow Mr. Todd to visit the hospitals without further notice. As we go to press we understand that the Local Government Board persists in its refusal to appoint a doctor of military age, and that the guardians adhere to their appointment, the chairman remarking that, when the person appointed was fit and proper, the Board had power over the salary, but over nothing else.

The Local Government Board has also refused to sanction the appointment, as he is of military age, of Dr. T. Cronin, of Newry, to be locum-tenent for Mr. F. P. McDermott, dispensary doctor of Donaghmore, whom the guardians had given permission to join the Royal Army Medical Corps. In the circumstances the guardians have decided not to allow Mr. McDermott leave of absence to join the Royal Army Medical Corps unless he provided a locum-tenent over military age.

AWARD OF MILITARY MEDALS TO NURSES.—The Military Medal for bravery has been awarded to five Army nurses—Miss B. A. Allsop, Miss N. Easeby, Miss E. Hutchinson, Miss M. M. Tunley, and Miss J. S. Whyte. Four of these nurses had been wounded and were still on duty.

A DEPÔT for the preparation of sphagnum moss dressings has been opened by the St. John Ambulance Department at 10, Coney-street, York. The depôt is to serve all the military hospitals in the city. The premises have been lent by the proprietors of the *Yorkshire Herald*.

Obituary.

ROBERT WALTER DOYNE, M.A. OXON., F.R.C.S. ENG.,

LATE READER IN OPHTHALMOLOGY, UNIVERSITY OF OXFORD; CONSULTING OPHTHALMIC SURGEON TO THE RADCLIFFE INFIRMARY, OXFORD, ETC.

IT is with great regret we announce the death of Mr. R. W. Doyne. Born in 1857, he was educated at Marlborough, and matriculated at Keble College in 1875. Illness prevented his remaining at Oxford, and on leaving he joined the Bristol Medical School and later St. George's Hospital. Having obtained his qualification of M.R.C.S. Eng., he was for a short time in practice in Bristol. In 1883 he joined the Navy, but left it in 1885, on his marriage, and settled in Oxford.

From the outset of his life in Oxford Doyne made a special study of ophthalmology, and in spite of a good deal of local opposition he started an eye hospital. Beginning in a very small way with an eye dispensary in a builder's yard, he worked steadily on, encouraged by the warm support of many good friends, such as were the late Dr. Liddell, of Christ Church, the late Bishop Paget, Dr. Talbot, the Warden of Keble, and others. Soon the committee rented on a long lease buildings from the County Hospital, and so the Oxford Eye Hospital grew little by little till it became one of the best known and most useful institutions in the Midland counties. After more than 25 years' continuous service, in 1912 Doyne resigned the post of senior surgeon to the Oxford Eye Hospital, and many of his personal friends and admirers seized the opportunity of connecting his name permanently with the institution by placing within its walls an excellent marble bust of him with an inscription commemorating his services. He was consulting ophthalmic surgeon to the Radcliffe Infirmary, and was also the first reader in ophthalmology to the University of Oxford, a position which he held for 11 years. For several years Doyne was surgeon to the Royal Eye Hospital, London. It was due to his energy and powers of organisation that there was started in Oxford a congress of ophthalmologists, which has for years met with unqualified success, and which has attracted to its discussions some of the most eminent oculists from every part of the world. For many years Doyne was the leading spirit of these gatherings, and proved himself a most genial and kindly host. Consequently, when ill-health prevented his attending the last two gatherings, the expressions of regret and sympathy forwarded to him from the members of the congress present were very genuine.

Of Doyne's skill as an oculist many would be glad to testify, and his boundless generosity to patients in needy circumstances was well known to some of his intimate friends. His death at a comparatively early age was due very largely to the intensity of energy he threw into any project he took up and the scant amount of rest he allowed himself. It was especially due to this superabundant energy that he bore down the opposition he met with from time to time in carrying out the numerous enterprises connected with his name. In private life it would be difficult to meet with a more generous friend. In his periods of relaxation he delighted to gather together his friends round him, and would do everything in his power to make them enjoy themselves. One of his chief amusements was fencing, and he was the founder of the Oxford Fencing Club. He leaves a widow and two sons, one of whom, Mr. Philip Geoffrey Doyne, has been recently ophthalmic house surgeon at St. Thomas's Hospital.

GEORGE MICHAEL JAMES GILES, M.B. LOND., F.R.C.S.,

LIEUTENANT-COLONEL, I.M.S. (RETIRED) AND CANADIAN MEDICAL SERVICE (RETIRED).

Lieutenant-Colonel G. M. J. Giles, I.M.S. (retired), died in Plymouth on August 24th. The deceased was the son of the late Captain G. Giles, R.N., of Plymouth, and shortly after graduating M.B. of London in 1877, joined the Indian Medical Service. He served in the South African War of 1878–79, and took part in the operations against the Galekas and the Zulus, for which he was awarded the medal and clasp. On retiring from the Service he went to Plymouth, but four years ago removed to Kingston, Ontario. Shortly after the outbreak of the present war he joined the Canadian Army Medical Service, and later returned to England, and was appointed medical officer to the Barcote House Hospital at Abingdon, but owing to ill-health he resigned the post last March.

THE LATE SIR VICTOR HORSLEY.

A CORRESPONDENT writes to us from a British General Hospital in Mesopotamia giving some notes regarding the death of Sir Victor Horsley. For various reasons the letter has been delayed in transit, and we now print such details as did not appear in our obituary notice of July 29th.

The sudden death of Colonel Sir Victor Horsley was a profound shock to those of us serving in Mesopotamia. We had all seen him so full of energy and apparently so little affected by the climate that it appeared established that he at least would not be knocked out by the great heat. When I met him in Alexandria in March last it was plain that his strenuous work in that city and at the Dardanelles had tried him much. But the comparative quiet after the evacuation had given him the opportunity of making a trip to Luxor. He showed me a beautiful series of photographs, many of them taken in the very early morning, which were real works of art. At a largely attended clinical meeting at No. — General Hospital Sir Victor opened a discussion on the Treatment of Gunshot Wounds of the Head and gave us the results of his experiences in the present war. He referred to the way in which these had confirmed his early views regarding the production of optic neuritis in cases of cerebral tumour. He had certainly richly earned a rest in England, and I understood that as he considered his work in Egypt over it was his intention to return home and to find a seat in Parliament, so that he might place his experiences at the service of his country at a time when they were likely to be of the most use. It was, therefore, with no little surprise and pleasure to learn soon after my arrival at Basrah that Sir Victor was expected there as consulting surgeon to the Mesopotamian Forces. On Good Friday, April 21st, I accompanied him round the wards of the British General Hospital, spending there a clinical morning to which I shall always look

back with pleasure. Sir Victor took the keenest interest in everything, and at once saw where his advice and influence might be of service to the patients and the staff. It was obvious that his stay in Mesopotamia was to be taken up with hard work in spite of the climatic conditions. He made two trips to the front inspecting the field ambulances. I had a cheerful letter from him dated June 17th. Our next meeting was after my arrival in Amara, when I met him just as he was admitted to hospital. Though looking ill he was as breezy as ever, and at once began to talk about some arrangements of mutual interest. He attributed his indisposition to the heat, which had been very trying for some days, and on this particular afternoon the thermometer had reached 120° F. in the shade. But he thought that his trouble had been overcome and that after a few days' rest he would be quite well again. This was about 7 P.M. on Saturday, and on Sunday at 8 P.M. he died. The funeral took place on the evening of July 17th, and between 80 and 100 members of the R.A.M.C. and I.M.S. followed the body from the Rawal Pindi Hospital to the grave. It seemed fitting that after his work for the service Sir Victor should have found a soldier's grave. All of us here feel his death very deeply and the loss of a wise counsellor and friend just at a time of great need.

THE LATE PROFESSOR T. G. BRODIE.

Professor W. D. Halliburton writes as follows concerning Professor T. G. Brodie, an obituary notice of whom appeared in our issue of Sept. 2nd:—

Brodie was one of a band of exceptionally brilliant students, several of whom are now on the King's College Hospital staff. He was a leading spirit among them, carried off most of the prizes the College had to offer, and would have proved eminently successful in any branch of medical science he chose to select. His choice fell on physiology, and he not only published brilliant research work of his own, but gathered around him a band of workers whom he inspired by his energy and contagious enthusiasm. At the time of his death he was holding the chair of physiology at the University of Toronto, spending in London the long vacations which Canadian professors enjoy. Last year he came over as Captain in the Canadian Medical Service, and this summer also he held the same position. His services in relation to original work arising out of the war were invaluable; the subjects he specially took up were respiratory changes in disease and injury, and the means of re-educating maimed men to resume a useful life. As a teacher Brodie was very successful, and he never failed to win the respect and affection of his pupils. He made no pretence of being an orator, but his deliberate incisive manner compelled attention to his lucid expositions. He was a friend worth having—loyal, affectionate, bright, and delightful in every sense of the word. He was a keen student of literature and an adept in all forms of athletic sport, and was never so happy as when he was carpentering with his boys, or tramping or bicycling with his friends, the leader in all their fun and merriment. His death came quite suddenly and unexpectedly with heart failure. The funeral took place at Hampstead on August 23rd with full military honours.

Medical News.

PLAGUE: PRECAUTIONARY MEASURES AT BRISTOL.—At the meeting of the health committee on Sept. 5th Dr. D. S. Davies reported that there had been no fresh cases of bubonic plague in Bristol since August 10th. The contagion had been traced to rats in a rag warehouse, seven of which were proved to be infected. All the rats had now been destroyed, and a staff of 30 inoculated men had been employed to destroy the rags, amounting in the aggregate to over 200 tons. Hundreds of rats had been examined at the docks without finding any trace of infection. The rags were not imported, but some of them had come from other towns in the United Kingdom.

CONFERENCE ON VENEREAL DISEASES.—A representative conference of public authorities was held at Newcastle on August 31st to consider the proposals of the Local Government Board for the treatment of venereal diseases. The county councils of Durham and Northumberland, and the county boroughs of Newcastle, Gateshead, South Shields, Sunderland, Tynemouth, West Hartlepool, and Darlington were represented, as well as the Royal Victoria Infirmary, Newcastle, the Durham University College of Medicine, and other hospitals and infirmaries in the area. Councillor C. T. Stableforth, chairman of the corporation sanitary committee, presided over the conference, which was addressed by Dr. Arthur Newsholme.

OPEN-AIR SCHOOL AT SALFORD.—An open-air school has just been started in Salford. A large shelter in the David Lewis Recreation Ground adjoining Peel Park has been placed at the disposal of the Education Committee, and this has been converted into the schoolroom. Mr. C. H. Tattersall, medical officer of health of Salford, has selected 45 delicate children, who will attend from 9 A.M. to 6 P.M., the idea being to keep them from the slums as long as possible. Three daily meals are provided, and the children rest after each meal, blankets being provided for this purpose.

PLYMOUTH BOROUGH ASYLUM: RESIGNATION OF DR. W. H. BOWES.—At the last meeting of the committee of the Plymouth Borough Asylum the resignation of the medical superintendent, Dr. William Henry Bowes, was accepted with great regret. Dr. Bowes was appointed assistant medical officer to the institution in 1892, and seven years later became the medical superintendent. The asylum was built for 200 patients, and extensions have now provided accommodation for 500, and a new wing is to be erected after the war.

THE LATE MR. EDWARD THORNE, L.D.S.—Mr. E. Thorne, who was drowned at Croyde Bay, North Devon, on August 30th, whilst attempting to save a lady from drowning, practised in New Cavendish-street, and was dental surgeon to the Twickenham Education Committee from the starting of the scheme for school dental clinics. Mr. Thorne leaves a widow and three children.

IN the Students' Number of THE LANCET (August 26th) students are asked to communicate with the Registrar of the General Medical Council at 299, Oxford-street. We regret the error in respect of the address. The present address of the Council is, of course, 44, Hallam-street, Portland-place, W.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street.—Resident Surgical Officer. Salary £300 per annum, with residence, &c.

CARDIFF, KING EDWARD VII.'S HOSPITAL.—House Surgeon for six months. Salary at rate of £140 per annum, with board, &c.

CHESTER, CHESHIRE EDUCATION COMMITTEE.—Female Assistant School Medical Officer. Salary £350 per annum.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—Resident Medical Officer. Salary at rate of £200 per annum, with board, &c.

DERBY, DERBYSHIRE ROYAL INFIRMARY.—Two Females as House Physicians, Anæsthetists, and Casualty Officers. Salary £150 per annum, with board, &c.

DUDLEY, GUEST HOSPITAL.—Assistant House Surgeon. Salary £120 per annum, with board, &c.

GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon.

HACKNEY UNION INFIRMARY, 230, High-street, Homerton, N.E.—Junior Assistant Medical Officer. Salary £250 per annum, with board, &c.

HARROGATE INFIRMARY.—House Surgeon.

ISLE OF MAN LUNATIC ASYLUM.—Assistant Medical Officer. Salary £200 per annum, all found.

LEEDS PUBLIC DISPENSARY.—Female Resident Medical Officer. Salary £200 per annum, with board, &c.

MANCHESTER, ANCOATS HOSPITAL.—House Physician. Salary £200 per annum, with board, &c.

MANCHESTER CORPORATION.—Temporary Assistant Tuberculosis Officer. Salary at rate of £350 per annum.

PLAISTOW FEVER HOSPITAL, E.—Female Second Assistant Medical Officer. Salary at rate of £150 per annum, with board, &c.

PLYMOUTH, BOROUGH LUNATIC ASYLUM.—Medical Officer. Salary £600 per annum, a furnished house, &c.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—Assistant Surgeon for Wednesday morning or afternoon and Saturday morning. Salary £25 per annum.

RHONDDA URBAN DISTRICT COUNCIL.—Female Assistant Medical Officer of Health and School Medical Officer. Salary £350 per annum.

SALFORD ROYAL HOSPITAL.—House Surgeon. Salary at rate of £200 per annum, with board, &c. And Junior House Surgeon. Salary at rate of £150 per annum, with board, &c.

SHEFFIELD, ROYAL INFIRMARY.—Two House Surgeons. Salary £100 per annum, with board, &c.

SHEFFIELD UNIVERSITY.—Demonstrator in Pathology and Bacteriology. Salary at rate of £300 per annum.

SUNDERLAND ROYAL INFIRMARY, CHILDREN'S HOSPITAL.—Resident Medical Officer for six months. Salary £150 per annum, with board, &c.

THROAT HOSPITAL, Golden-square, W.—Resident House Surgeon.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Alexandria, Dumbarton; and at Irvine, Ayr.

Births, Marriages, and Deaths.

BIRTHS.

ATTWATER.—On August 17th, at Grosvenor House, Southampton, the wife of H. L. Attwater, M.A., M.C. Cantab., F.R.C.S. Eng., Temporary Captain, R.A.M.C., of a son.

CHEATLE.—On Sept. 4th, at "Culamet," Beaconsfield, Bucks, the wife of Temporary Surgeon-General G. L. Cheatle, C.V.O., C.B., R.N.—a son, who lived only 11 hours.

CHETWOOD.—On August 23rd, at Douglas House, Cheam, the wife of Sydney W. Chetwood, L.D.S. Eng., of a son.

HOLLAND.—On August 16th, at Queen Anne-street, W., the wife of Bardley Holland, M.D., of a daughter.

MATTHEWS.—On August 30th, at "The Bays," Kingston-on-Thames, the wife of Edgar W. Matthews, M.B., B.S. Lond. (Captain, R.A.M.C.T.), of a son.

MITCHELL.—On August 28th, at Hatherleigh, North Devon, the wife of W. Forest Mitchell, L.R.C.P., L.R.C.S. Edin., L.F.P.S. Glasg., of a son.

O'BRIEN.—On August 28th, at Surgeon's House, Royal Military College, Camberley, to Dorothy, wife of Major C. W. O'Brien, R.A.M.C.—a son.

PALMER.—On August 29th, at Marine-parade, Worthing, the wife of Albert Sydney Morton Palmer, M.A., M.D. Cantab., B.C., of a son.

STANGER-LEATHES.—On August 29th, at Poona, India, the wife of Major Hugh Ellis Stanger-Leathes, I.M.S., M.R.C.S., L.R.C.P. Lond., D.T.M. & Hy. Camb., of a son.

MARRIAGES.

BLIGHT—WIGFULL.—On Sept. 6th, 1916, at St. Andrew's, Sharrow, by Rev. E. Blackburn, M.A., Vicar of Cowick, brother-in-law of bridegroom, Wm. Lyne Blight, M.D., F.R.C.S., of Cardiff, to Clara Jane, daughter of late Mr. Benry Wigfull and Mrs. Wigfull, of Chelsea House, Brincliffe, Sheffield.

BORLAND—JACOBSON.—On August 24th, at St. George's Church, Campden-hill, W., by the Rev. R. M. Davies, Vynne Borland, M.B., Ch.B., Glasgow, to Stella Geneva Jacobson, New York.

HANNA—NEWTON.—On August 28th, at the Wesleyan Chapel, Sandgate, Charles Eber Hanna, Captain, C.A.M.C., to Edna L. T. Newton, of Brooklyn, New York, U.S.A.

KITCHING—BOUCHER.—On August 30th, at Frolesworth Church, by the father of the bride, Robert Lacy Kitching, Captain, R.A.M.C., M.B., B.S., Durh., to Alyson May Estcourt, elder daughter of the Rev. Canon and Mrs. C. E. Boucher, of Frolesworth Rectory, Lutterworth.

RAMSAY—FARRELL.—On August 31st, at the Cathedral, Plymouth, by the Rev. Father Wal h, Captain Maxwell Ramsay, R.A.M.C., youngest son of the late Mr. Keith Ramsay, Dunedin, New Zealand, to Anna Farrell, second daughter of Mr. P. C. Farrell, Cork.

DEATHS.

BARK.—On August 27th, at 20, Fosse-road Central, Leicester, Ernest O. Bark, M.R.C.S. Eng., L.R.C.P. Lond., formerly of Birmingham, aged 67 years.

DOYNE.—On August 30th, at Woodstock-road, Oxford, Robert Walter Doyne, F.R.C.S. Eng., and M.A. Oxon., founder of the Oxford Eye Hospital, and late Margaret Ogilvie Reader in Ophthalmology, Oxford University, aged 59 years.

ENNALS.—On August 30th, at Rosebury, Findon, Sussex, Charles Thomas Ennals, J.P., M.R.C.S. Eng., L.S.A., late of Thornton House, Louth, Lincs., in his 80th year.

FREEMAN.—On August 29th, suddenly, Delamark Freeman, M.R.C.S., L.S.A., of The Gables, Pangbourne, Berks, late of Dorset-square, London, W., in his 80th year.

HARMAN.—On Sept. 2nd, at Bexhill, John Harman, M.R.C.S. Eng., L.S.A., late of Brixton and Streatham, aged 80 years.

HARRIS.—On Sept. 1st, at Paglesham, Essex, Edward Bernard Harris, M.R.C.S. Eng., L.R.C.P. Lond., L.S.A., late of 1, Holy Innocents-road, Hornsey, aged 52 years.

RYDER.—On Sept. 1st, at Ramsgate, Dudley Howe Ryder, M.R.C.S. Eng., and L.S.A., formerly of Greenwich.

STENHOUSE.—On August 25th, of wounds received in action on July 18th, Captain John Maitland Stenhouse, R.A.M.C., B.A., M.B., B.C. Camb., second son of the late Major-General W. Stenhouse, Indian Army.

WOOLLCOMBE.—On August 30th, at The Crescent, Plymouth, Walter Ley Woollcombe, F.R.C.S. Edin., M.R.C.S., L.R.C.P. Lond., aged 51 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Sept. 6th, 1916.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp	Wet Bulb.	Dry Bulb.	Remarks.
Aug. 31	30·000	W.	...	113	68	49	51	54	Fine
Sept. 1	30·000	S.W.	0·07	109	73	54	60	61	Raining
,, 2	30·090	S.	0·21	75	61	57	57	58	Raining
,, 3	29·930	S.W.	0·22	104	68	56	60	63	Raining
,, 4	29·740	N.W.	0·40	105	65	55	53	58	Cloudy
,, 5	29·880	N.	0·04	102	64	53	52	55	Overcast
,, 6	30·214	N.	...	107	68	50	56	58	Cloudy

Notes, Short Comments, and Answers to Correspondents.

HEALTH OF SIERRA LEONE.

ACCORDING to the report on the Colony and Protectorate of Sierra Leone for the year 1915, which has been prepared by the Colonial Secretary, Mr. A. C. Hollis, C.M.G., the outstanding feature of the public health was an outbreak of small-pox. The epidemic probably originated in French territory and spread down the trade-route from Kindia to Kambia on the Lesser Scarcies River in October. In spite of the vigorous measures which were taken to vaccinate the population and carry out a systematic scheme of isolation and disinfection, the disease infected almost all the towns and also spread in the country around. Fortunately, the epidemic was in a very mild form, and this feature, added to the extensive vaccination which is being carried out, is likely to ensure comparative freedom for some years to come. Of 6880 vaccinations performed in 1915, 4976 were successful and 1276 unsuccessful; the remainder were not observed. Six cases of blackwater fever came under notice during the year. Three cases of sleeping sickness were discovered at Kissy, Makene, and Kaballa respectively. 100 cases of tuberculosis were treated, most of which were of the pulmonary variety. The infection is, as a rule, virulent, and the disease runs a rapidly fatal course. Of a total of 992 deaths for the year in Freetown (the capital) 31 were returned as due to tuberculosis. The returns of malaria show that 2221 cases were treated, as compared with 2460 in 1914. During the year 22 cases of leprosy were treated, and it is noted that the disease has been discovered in a rat. The population of the Protectorate is estimated at 1,327,560, all of whom, with the exception of 3426, are natives belonging to one or other of the various tribes. The population of the Colony (as distinguished from the Protectorate) was returned at the last decennial Census in 1911 as 75,572 (41,001 males and 34,571 females). The birth-rate in 1915 was 19 per 1000 of the population and the death-rate 22 per 1000; in Freetown the birth-rate was 21 and the death-rate 29 per 1000. The number of European and American residents was 1201, of whom 698 were military and 258 civil officials. There were 14 deaths of Europeans during the year. The number of in-patients and out-patients treated at the various hospitals and dispensaries in 1915 totalled 50,513. A Public Health Ordinance has been passed, which deals with public health in the Protectorate. It places sanitation in the Protectorate upon a definite legal footing, whereas previously only advice and persuasion could be brought to bear. Presentation swords and certificates have, as usual, been awarded to those native chiefs whose zeal in promoting the sanitary conditions of their chiefdoms has appeared to merit recognition. The mean maximum temperature of the year at Tower Hill Observatory was 87·8° and the mean minimum 74·4°. The rainfall at the same observatory was 127·40 inches, whilst at Hill Station it was 165·06 inches.

PEMMICAN.

To the Editor of THE LANCET.

SIR,—The only derivation I can find for this word, in reply to "Enquirer," is that it is American Indian. A reference is given in Funk and Wagnall's Standard Dictionary in an extract from E. B. Tylor's "Anthropology," ch. 2, 1881, "To the buffalo-hunting tribes of North America belongs the invention of *pemmican*, meat dried and pounded for keeping."

I am, Sir, yours faithfully,

Harley-street, W., Sept. 5th, 1916. REGINALD EVERSHED.

To the Editor of THE LANCET.

SIR,—Dr. J. Brindley-James in your issue of Sept. 2nd professes to give the "derivation" of this word, but he only gives its *meaning*. The word (or rather three words) has been borrowed from the Cree Indians, and means literally "dried by the sun."

I am, Sir, yours faithfully,

Sept. 2nd, 1916. X. Y. Z.

MEDICAL REPORTING.

A USEFUL little book on "Medical Reporting in Pitman's Shorthand" has recently appeared from the pen of Mr. H. Dickinson. (London: Sir Isaac Pitman and Sons. Pp. 87. Price 3s. net.) After a few pages of hints to beginners he gives more than 60 pages containing 3500 outlines of medical phrases which he has found useful in his own work. We notice new and improved outlines for carotid artery, extravasation of urine, antistreptococcic serum, rupture, and laboratory tests; and outlines for some additional words, such as fluorescent screen; and several others which are not included in the "Phonographic Outlines of Medical Terms" issued some years

ago by the Society of Medical Phonographers. The author is obviously a very skilled and also light-handed writer, and some of the outlines would be difficult for the average reporter. In following a rapid speaker there is no time for the ordinary reporter to write with accuracy such finger-twisters as his outline for Tertiary Syphilis, while Trigeminal Neuralgia has a configuration which would seriously interfere with the line of writing below. If some of the outlines show a desire to follow theoretical rules at the cost of rapid writing and accurate transcription, this is a personal matter with the author. Some writers may find, also, that the mere joining of words does not always conduce to speed. In Granuloma Fungoides, for example, time is lost by the physical and mental effort involved in making the junction between the *m* and the *f*. In the case of Woolsorter's Disease an intersected *d* makes a preferable outline. All practical reporters use their own abbreviations according to need, but all will derive useful hints from Mr. Dickinson's book, which is the outcome of great experience in a field of reporting where absolute accuracy is needed.

THE DUTIES OF A PARISH COUNCIL.

A LADY visitor at Beer (Devon), recently, whilst watching a rough sea, was instantaneously killed by the falling of a piece of rock from the cliff, the weight of which was said to be about a ton. Beer adjoins Seaton, and at the latter place there is a notice warning visitors of the danger of falling rock, but Beer has no such danger notice, and consequently visitors approaching Seaton from Beer would be unwarned. The jury returned a verdict that death was due to a fall of cliff, and added a rider that notice-boards should be put up, and the landlord be asked to remove the dangerous protruding part of the cliff. The medical man who gave evidence at the inquest said he had attended 14 patients who had received injuries from falls of the cliff; he had been a member of the Beer parish council for nine years, and had tried to induce the council to put up warning notices, but without any effect. The sad fatality has occasioned much comment in the neighbourhood, and the local press allude to the gross neglect of the parish council in the matter. Now the accident has happened doubtless steps will be taken to prevent a recurrence of such a casualty, and the council will listen to the warnings of the medical man.

THE ATHENÆUM SUBJECT INDEX TO PERIODICALS.

AT the request of the council of the Library Association, the *Athenæum* has issued from Bream's Buildings, Chancery-lane, a series of subject indices to periodicals, of which eight fascicles are in our hands. These deal with: 1. Hygiene and Preventive Medicine. 2. European War: Its Economic, Political, and Military History. 3. Language and Literature. 4. Economic and Political Sciences; Law. 5. History, Geography, Anthropology, and Folk-lore. 6. Theology and Philosophy. 7. Education. 8. Fine Arts and Archæology. The complete Index for 1915 is to contain not less than 10,000 entries, selected from over 350 English, American, and Continental periodical publications. It is based upon the alphabetical subject headings of the Library of Congress. In the class list dealing with Hygiene and Preventive Medicine, which specially concerns us, are 14 pages, containing some 250 subject headings, with an authors' index to follow of 350 names, referring to 70 periodicals of which the publisher's name and address are given. To take a single example: Under the heading Flies as Carriers of Contagion will be found 14 references to papers in the *British Medical Journal*, *Field*, *Lancet*, *Nature*, *Comptes Rendus of the Academy of Science*, *La Nature*, and *Bulletin of the U.S. Department of Agriculture*. Cross references are given to other papers under Mosquitoes, Tsetse Fly, and Typhoid Fever. Such lists must greatly facilitate ease of reference to contemporary literature. The prospectus states that the Index is not run for profit, and that contributors and editors are unpaid. The complete set of 11 class lists for 1915 costs 10*s*. 6*d*., and the yearly subscription, to include the annual volume, is £2 10*s*. Arrangements have been made with the library department of Messrs. W. H. Smith and Son (186, Strand, W.C.) for the loan of articles indexed at a charge of 4*d*. each.

THE FRENCH "CROIX DE GUERRE."

THIS new decoration is a bronze cross patée with two crossed swords alternating with the four arms and intersecting a small round medallion in the centre with the head of "Marianne" (as the French flippantly call the lady who symbolises the Republic) and is suspended by a ribbon of green silk with six thin red stripes. Slantwise across this ribbon lies a bronze palm leaf.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.

THURSDAY.—5.15 P.M., Clinical Lecture.

MANAGER'S NOTICES.

ALTERATION OF INLAND SUBSCRIPTION RATES.

OWING to the alteration in the Inland Newspaper Postal rate, the postage on each copy of THE LANCET will in future be 1*d*., and sometimes 1½*d*.

The revised Inland Subscription rates are:—

One Year	£1	3	3
Six Months	0	13	8
Three Months	0	7	0

The rates for the Colonies and Abroad (thin paper edition) will be as usual:—

One Year	£1	5	0
Six Months	0	14	0
Three Months	0	7	0

Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given above.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied.

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Books and Publications ... ...
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} Five lines and under 4*s*. 0*d*

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Per additional 8 words, 6*d*.

Quarter Page, £1 10*s*. Half a Page, £2 15*s*.

Entire Page, £5 5*s*.

Special terms for Position Pages.

Advertisements (to ensure insertion the same week) should be delivered at the Office not later than Wednesday, accompanied by a remittance.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C.

The following magazines, journals, &c., have been received:—New Zealand Medical Journal, Boston Medical and Surgical Journal, Journal of the Missouri State Medical Association, Medical Journal of Australia, Journal of the Royal Army Medical Corps, Gazette Médicale de Paris, Abolitionist, New York Medical Journal, Journal of State Medicine, Illinois Health News, Therapeutic Gazette, Medical Journal of South Africa, Journal of the Royal Sanitary Institute, South African Medical Record, Medical Record, Medical Review, Asylum News, Montreal Pharmaceutical Journal.

Communications, Letters, &c., have been received from—

A.—Messrs. Allen and Hanburys, Lond.; Dr. R. Attinyah, Atbara; Major R. Archibald, C.A.M.C.; Anglo-French Drug Co., Lond.; Mr. J. B. Aickin, Ferry Hill; Ardath Tobacco Co., Lond.; Argus Suisse de la Presse, Geneva; Dr. Robert Armstrong-Jones, Woodford Bridge; Mr. R. J. Albery, Lond.; Anglo-American Pharmaceutical Co., Croydon; Aberdeen, Medical Officer of Health of.

B.—Bread Developments, Matlock, Chairman of; Bombay Municipality, Public Health Department, Executive Health Officer; Birkenhead, Medical Officer of Health of; Staff-Surgeon C. S. Brewer, R.N.V.R.; Mr. W. R. Barlow, Okak, Labrador; Mr. A. Carnarvon Brown, Sevenoaks; Dr. F. Milnes Blumer, Stafford; Mrs. J. E. Budden, Hoylake; Birmingham General Hospital, House Governor of; Dr. F. Lucas Benham, Semaphore, South Australia; Dr. R. C. Buist, Dundee; Bihar and Orissa Government Press; Mr. W. Blandford, Lond.; Mr. W. Bryce, Edinburgh; Messrs. C. Barker and Sons, Lond.; Dr. W. Langdon Brown, Lond.; British Museum (Natural History), Lond., Director of; Dr. N. S. Bonard, Lond.

C.—Surgeon G. Cochrane, R.N.; Dr. W. Collier, Oxford; Messrs. J. and A. Churchill, Lond.; Charing Cross Hospital Medical School, Lond., Governors and Staff of; Mr. C. F. Clay, Lond.; Dr. F. G. Clemow, Lond.; Chicago School of Sanitary Instruction; Committee of the Privy Council for Scientific and Industrial Research, Lond., Secretary of; Commonwealth of Australia, Committee concerning Causes of Death and Invalidity in the, Melbourne; Cambridge Philosophical Society, Librarian of; G. W. Carnrick Co., Hornsey; California University Library, Associate Librarian of; Mr. A. C. Chandler, Corvallis, U.S.A.; Cheshire County Council, Chester, Chief School Medical Officer of.

D.—Messrs. Down Bros., Lond.; Mr. Clifford Dobell, Lond.; Mr. M. K. Dalal, Lond.; Lieutenant-Colonel A. M. Davies, R.A.M.C.; Messrs. W. Dawson and Sons, Lond.; Dr. E. C. Donnelly; Mr. Robert Donald, Lond.; Derbyshire Royal Infirmary, Derby, Secretary of; District Medical Officer, South Arcot, India.

E.—Mr. Reginald Eversbed, Lond.; Eugenics Record Office, Cold Spring Harbor; Captain T. P. Edwards, R.A.M.C.(T.); Messrs. Elliott, Son, and Boyton, Lond.; Erasmic Co., Warrington.

F.—Faridkot State, India, Treasury Officer of; Lieutenant-Colonel C. G. P. Fagan, Rainham; Factories, Chief Inspector of, Lond.

G.—Mr. Kenneth Goadby, Lond.; Captain N. C. Graham, R.A.M.C.; General Post Office, Lond., Comptroller and Accountant-General of; Gas Light Improvement Co., Lond.; Major H. Norman Garnett, R.A.M.C.; Captain P. Jacob Gaffikin, R.A.M.C.; Lieutenant-Colonel E. Goodall, R.A.M.C.; Mr. E. H. Godbold, Lond.; Dr. Alfred Greenwood, Maidstone; Sir James Grant, Ottawa; Guest Hospital, Dudley, Secretary of; Corporal P. P. Graham; Messrs. R. D. Galbraith and Co., Lond.

H.—Captain T. Houston, R.A.M.C.; Messrs. Hirst and Co., Lond.; Dr. A. C. Houston, Lond.; Major Arthur F. Hertz, R.A.M.C.; Professor W. D. Halliburton; Dr. C. T. W. Hirsch, Lond.; Home Office, Lond.; Messrs. Abel Heywood and Son, Manchester; Dr. A. Hottlet, Sheffield; Messrs. W. Heffer and Son, Cambridge; Messrs. J. Haddon and Co., Lond.; Harrogate Infirmary, Secretary of.

I.—International Press, Toronto; Institute for Medical Research, Kuala Lumpur, F.M.S., Director of; Indigenous Drugs Committee, Calcutta.

J.—Mr. E. L. Jones, Lond.; James Murray's Royal Asylum, Perth, Superintendent of.

K.—Messrs. J. F. Keogh and Co., Dublin; King Edward VII. Hospital, Cardiff, Secretary of.

L.—Mrs. E. J. Low, Rasthaven; Local Government Board, Lond., Secretary of; London Hospital Medical College, Lond., Secretary of; Leeds Public Dispensary, Secretary of; Messrs. H. K. Lewis and Co., Lond.; London Press Exchange; Dr. T. Laffan, Cashel; Liverpool Guardians, Clerk to the; Layman; Leicester, Medical Officer of Health of; Major C. A. Lees, R.A.M.C.; Mr. Edward P. Leary, Innisfail, North Queensland; Messrs. Lee and Martin, Birmingham; Lieutenant J. N. Luthra, I.M.S.; Messrs. Lea and Febiger, Philadelphia; Messrs. Eli Lilley and Co., Indianapolis.

M.—Mr. W. E. Mayne, Belfast; Maltine Manufacturing Co., Lond.; Miss Mackay, Liverpool; Dr. C. Gould May, Lond.; Messrs. C. Mitchell and Co., Lond.; Dr. Abd-el-Aziz Mahomed, Samalout, Egypt; Mundesley Sanatorium, Secretary of; Mr. James McKay, Lond.; Dr. J. Nelson Matthews, Ashton-under-Lyne; Dr. William Magner, Cork; Mr. J. McOscar, Buxton; Mrs. Myers, Bude; Medical Correspondence College, Lond., Secretary of; Messrs. Maruzen Co., Tokyo; Mr. Dan McKenzie, Lond.; Mr J. Y. W. MacAlister, Lond.; Mr. A. R. Mansell, Lond.; Lieutenant-Colonel C. S. Myers, R.A.M.C.; Dr. Flora Murray, Lond.

N.—Normanhurst Hospital, Battle, Secretary of; National Health Insurance Commission (England), Lond., Solicitor's Department of; National Clean Milk Society, Lond., Hon. Secretary of; Nottingham, Medical Officer of Health of.

O.—Messrs. Oetzmann and Co., Lond.; Sir William Osler, Bart., Oxford; Oldham, Medical Officer of Health of.

P.—Mr. G. R. Pillai, Tinnevelly; Polish Information Committee, Lond.; Messrs. Perrier, Lond; Dr. Chas. Porter, Johannesburg; Dr. F. G. Power, St. Helens.

R.—Mr. Paul B. Roth, Lond.; Dr. W. Robertson, St. Mark's, S. Africa; Captain C. Rhodes-Harrison, R.A.M.C.(T.); Royal Albert Memorial, Exeter, City Librarian of; Reading Pathological Society, Hon. Librarian of; Registered Nurses' Society, Lond.; R. F. O.; Dr. J. Ritchie, Edinburgh; Registrar-General, Edinburgh; Royal Earlswood Asylum, Superintendent of; Royal Society of Medicine, Lond., Secretary of.

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U.—Under-Secretary of State for India, Lond.; University of London, Academic Deputy Clerk of; Captain W. H. Unwin, N.Z.M.C.; Dr. Yngvar Ustvedt, Christiania.

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Y.—Messrs. Alexander Young, Lond.

Letters, each with enclosure, are also acknowledged from—

A.—Mr. E. Arnold, Lond.; A. N.; Messrs. Arnold and Sons, Lond.; Ashwood House, Kingswinford, Medical Superintendent of; Dr. R. A. J. Ashbury, Westcliff-on-Sea.

B.—Mr. W. R. Bristow, Lond.; Major W. Byam, R.A.M.C.; Birkenhead Guardians, Clerk to the; Messrs. Burroughs, Wellcome, and Co., Lond.; Mr. E. Byrne, Slane; Captain H. Bedingfield, R.A.M.C.; Belfast Corporation, Chamberlain to the; Mrs. Boggs, Liverpool; Surgeon W. H. Butcher, R.N.; Dr. E. G. Bark, Lond.; Mr. D. M. Bell, Pelham Manor, U.S.A.; *British Journal of Nursing*, Lond.

C.—Mr. R. S. Cundall, Leeds; Messrs. J. and A. Carter, Lond.; Church Army, Lond.; Miss B. Cumberpatch, Crowborough.

D.—Dr. Lovell Drage, Hatfield; Dorland Agency, Lond.

E.—Lieutenant J. I. Enright, R.A.M.C., E. E. L.; Dr. G. Edholm, Lond.

F.—Lieutenant C. J. Fernandes, I.M.S.; Mr. H. Freeman, Lond.

G.—Mr. S. H. Griffiths, Lond.; Dr. Edith M. N. Green, Lond.; Colonel H. M. W. Gray, C.B.; Dr. S. Gill, Formby; Dr. S. Gross, Lond.; Dr. R. E. Garrett, Lond.; Dr. T. Grainger, Consett; Messrs. Godsell and Barnett-Smith, Lond.; G. C. A.

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I.—Dr. Abd el Aziz Ismail, Cairo.

K.—Mr. C. Kenwick, Rigbaston; Dr. A. Beresford Kingsford, Lond.

L.—Mr. M. Le Soudier, Paris; Lloyd's Bank, Lond., Manager of.

M.—Dr. J. C. Maddison, Sheffield; Dr. G. Metcalfe, Skelmersdale; Manchester Corporation, Accountant to the; Dr. C. J. Mac-Aulev, Dublin; Dr. Angus Macdonald, Grenada.

N.—Miss H. F. Norry, Lond.

P.—P. F.

R.—Dr. M. J. Ryan, Crumlin; Messrs. Rowley and Co., Lond.; R. C.; Mr. L. J. Rhea; Dr. J. Ritchie, Stockport.

S.—Dr. S. H. Snell, Christchurch; Mr. A. Snowdon, Hulton Rudby; Messrs. Spiers and Pond, Lond.; Surgeon, Loughborough; Mrs. Stevenson, Lond.

T.—Mr. L. D. Taylor, Lond.; Mr. P. Turner, Lond.

U.—University College, Cork, Secretary of.

V.—Messrs. Van Houten, Lond.; Mr. W. H. Venables, Lond.

W.—Mr. W. J. Whyte, Lond.; Dr. P. C. Woudberg, Cape Town; Mr. A. C. J. Wilson, Penistone; Waterbury Chemical Co., Des Moines; W. E. R.; Captain B. W. Wibberley, R.A.M.C.; Warneford Hospital, Leamington, Secretary of.